

Hitchcock's Machine Tool Blue Book

MAY, 1936

THIRTY-FIRST YEAR

THIS COLLET DATA BULLETIN AVAILABLE
FOR

Purchasing, Stockroom and Engineering Departments

ALL TYPES




ALL SIZES



HARDINGE

COLLETS, STOCKS AND
DRAW-IN COLLETS
FOR ALL
LATHES AND MILLERS



FOR
— ACCURACY—
— DURABILITY—
— ATTRACTIVE PRICES—
"SPECIFY HARDINGE COLLETS"

Also Collets from 1/8" to 1 1/2" diameters.
 Reference Engineering Department, The Hardinge Company, Elmira, N. Y.

Hardinge Collets are a stock for immediate delivery. Hardinge Collets attract
 these elements of groups which have characterized its products since 1880.

HARDINGE BROTHERS, INC., ELMIRA, NEW YORK

ASK FOR BULLETIN NO. 36

Reasons Why Each Department Should Have a Copy:

1. Clearly shows the styles of collets adapted in your lathes and millers.
2. Lists the standard collets with general dimensions for identification.
3. Gives normal round, hexagon and square capacity of standard collets.
4. Shows how all of your lathes and millers may be adapted for collets.
5. Collet stocks in Elmira, Chicago, Detroit, New York and Los Angeles.
6. Attractive prices are listed for round, hexagon and square hole sizes.

HARDINGE BROTHERS INC.,.....ELMIRA, N. Y.

PUBLISHED AT 508 So. DEARBORN ST. CHICAGO



MARVEL Tapping Machine

7 Sizes
Capacities
Spindle Speeds

LOW PRICED HORIZONTAL TAPPERS

universal type that handles the widest range, they do the work of more complicated, more restricted and more expensive machines. Smooth friction action saves taps. Double-spring sliding tables, simplifies jigs and fixtures. Capacity range from fine No. 0 to $\frac{1}{2}$ " U.S.S. taps in steel. Bench and floor models, all motor driven.

STANDARDIZED ATTACHMENTS

for all models—any or all can be added to plain bench machines at any time.

1. Rear lever action, with spring return.
2. Front lever action, with automatic depth trip and automatic reverse.
3. Foot treadle action (on floor models only).
4. Quick-change spindles available for threading, tapping, nut or stud driving, etc.
5. Special two-tap geared spindle available from No. 0 to $\frac{1}{4}$ " capacities.

Write for Bulletin No. 500

ARMSTRONG-BLUM MFG. CO.

"The Hack Saw People"

341 N. Francisco Ave., Chicago, U. S. A.

New! DEFENDER DRILLS

Built by Skilsaw

**Set a New Standard
of Quality in the
LOW PRICE FIELD!**



BEARINGS — Oilite Bronze-Self-Lubricating. Provide constant lubrication and a hydraulic cushion for high pressure and shock loads.

MOTOR — Extra overload capacity insures cool running and longer life.

GEARS — Special alloy steels, helically cut for quiet operation.

FRAME — Die-cast for strength and lighter weight.

COMPACT — LIGHT WEIGHT — EASY TO HANDLE

● **SKILSAW** has built "extra value" into these low priced drills. Analyze their specifications, power and drilling speed and you will find a quality of construction and engineering refinements never before offered in the low price field! The user whose work justifies only an inexpensive tool, can now buy **DEFENDER** Drills with full confidence that they **will do the job . . .** and give years of satisfactory service!

NOW 16 POWERFUL MODELS

There is a size and type of drill made by **SKILSAW** for every drilling purpose. *See your distributor and write for our new catalog.*

SKILSAW, INC.

3304 ELSTON AVENUE, CHICAGO
210 E. 40th St., New York—52 Brookline Ave., Boston
312 Omar Street, Los Angeles
Sales & Service For Canada: 85 Balmora Ave., Toronto

Rivett

DRAW-IN COLLETS AND CHUCKS



SPRING TEMPERED

Scientifically heat treated to a true spring temper, "RIVETT MARK" collets resist wear and hold their spring longer than collets of any other make. *Write for Bulletin 100-B.*

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R. E. Ellis Engineering Co.,
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DETROIT

Chas. A. Strelinger Co.,
149 E. Larned St.

RIVETT LATHE & GRINDER INC.
BRIGHTON, BOSTON, MASS.

Hitchcock's Machine Tool Blue Book

**Selected
Circulation**

**20,000
Monthly**

MAY, 1936

THIRTY-FIRST YEAR

Advertise
in
Hitchcock's

FOR
LOWEST
COST
SALES

Published By

Hitchcock Publishing Co.
508 S. Dearborn St., Chicago, Ill.

Consult the Classified Finding Index for your requirements



Keller Burs and Rotary Files *for all your finishing needs!*

These tools do a better job than hand files, with a fraction of the effort. They reach the otherwise inaccessible places. They are used on a wide variety of metal and non-metallic surfaces by almost every industry.

Keller burs are the result of the combined experience of the Keller and Pratt & Whitney organizations in the production of Small Tools. Rigid specifications control the material, manufacture and heat treatment, so that each bur conforms to the high standards established. Every bur is particularly suited for the it must do.

SEND FOR OUR BUR CATALOG

PRATT & WHITNEY

**DIVISION NILES-BEMENT-POND CO.
HARTFORD, CONN., U. S. A.**

*Check into
these MODERN PRODUCTS*

It will pay you to check up on these MODERN *money saving* Products. And there are many more described in our new catalog. Be sure to write for it.



MODERN "Shaverite" Shaving Tool

It features a dove tail slide with adjustable gib to eliminate all play thereby making it more solid than the usual holder. So accurate it often replaces grinding. May also be used for light forming operations.

SPRING COLLETS



Made of special steel with hard wearing surfaces and a tough springy core. Taper guaranteed accurately ground true to hole. Deep corrugations assure positive grip. Smooth surfaces furnished upon request. Superior gripping surfaces make locking fingers and shoes last longer. Special shapes furnished to meet blue print specifications.



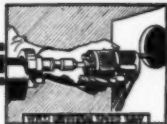
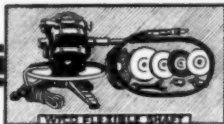
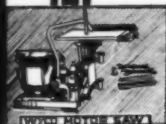
MODERN FEED FINGERS

The feed fingers that are universally used. Same feeder can be used for hexagon, or round stock, or round and square stock. When loose, can be tightened without special tools. Long wearing because they are made of special analysis steel.

Modern Collet & Machine Co.

400 Salliotte Street

Ecorse, Michigan



The WYCO Line

1. Practical Working Tools.
2. Guaranteed Quality and Performance.
3. The Best Tools at the Right Price.

**The WYCO Speed Saw,
The WYCO Hole Cutters,
The WYCO Motor Disc,
The Full Line Of
WYCO Flexible Shafts
ARE LABOR SAVING—
MONEY MAKING TOOLS!**

**Your Dealer Will
Demonstrate WYCO Tools.**

Write For Catalog No. 36

WYZENBEEK & STAFF, INC.

642 WASHINGTON BLVD.

EXTREME PRECISION



Built in 2 sizes:
No. 8 capacity 8x16"
No. 4 capacity 4" rd.
or 7 1/2x3".

**Avoid
Re-Cutting
Expense**

•
**Continuous cut-
ting without
coolant.**

•
**Blade wears
evenly and does
not cut untrue.**

WELLS METAL **BAND SAW** CUTTING

**Cuts hundreds of duplicate
pieces without showing a vari-
ation of .005" in thickness.**

Cuts all kinds of metal—hot or cold rolled machine steel, carbon tool steel, monel metal and alloys—with unerring accuracy in any shape at any angle. It will handle any metal—thick or thin, sheet rod or tubing, up to the limits of its generous capacity. Cuts time & costs 30 to 50%.

Make the Wells Band Saw your tool for getting full capacity production at the lowest possible metal-cutting cost.

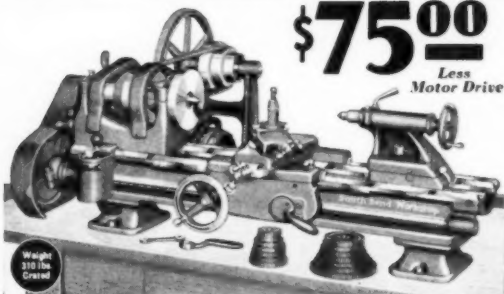
Send for the descriptive folder today.

The Wells Manufacturing Corporation
THREE RIVERS, MICHIGAN

*This New 1936 Model
Genuine South Bend*

LATHE

\$75⁰⁰
Less
Motor Drive



9 $\frac{1}{8}$ " x 3' Workshop Bench Lathe with Horizontal Countershaft, $\frac{1}{4}$ h.p. reversing motor and switch, and belting as shown. **\$98²⁵**

This New 1936 model 9" x 3' Workshop Bench Lathe is a back-geared, screw cutting precision lathe, capable of handling the finest, most accurate jobs in manufacturing, in the tool room and laboratory.

Lathe may be fitted with draw-in chuck and collets, grinder, taper attachment, milling attachment and 34 other attachments for all machine shop operations.

Write for Catalog 15-R

Shows this lathe in eight different drives and four bed lengths. *Sent Free. Easy Payments. Terms if desired.*

**SOUTH BEND
LATHE WORKS**

191 E. Madison St.,
South Bend, Ind., U.S.A.

FREE! 24 Page Book



SOUTH BEND *Precision* **LATHES**



A difference you can't see... until you put them to work

S. S. WHITE cutting and grinding tools look much the same as similar tools of the ordinary run, but—they cut faster, cleaner, truer and they last longer. The reason? Better materials, more accurate construction—and over a half century of manufacturing experience. Prove it to your own satisfaction—try them.

CATALOG TA shows the wide range of shapes and sizes of burs, drills, rotary files, abrasive points, disks and wheels . . . Also S.S. WHITE FLEXTOOLS—small portable flexible-shaft-driven outfits, complete with motor and handpiece. COUPON below will bring you a copy, with prices. MAIL it—now.

The S. S. WHITE Dental Mfg. Co., INDUSTRIAL DIV.
10 East 40th St., Room 2310H, New York, N. Y.



Send me a copy of CATALOG TA

NAME

FIRM

ADDRESS

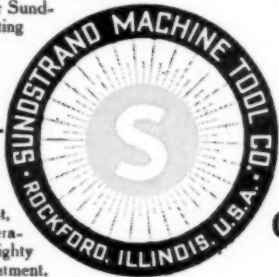
CITY STATE

SUNDSTRAND BALANCING TOOLS

Save time and money. Anti-friction discs; strong, well made, economical. Range in size from No. 1 Bench, with capacity for 800 lbs., to No. 5 Extra Heavy, with capacity for 24,000 lbs. Others available for balancing airplane propellers, balancing and drilling flywheels, pulleys, etc.

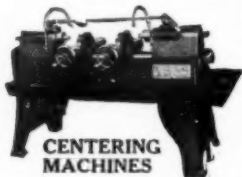


Write, **today**, for details on these and other Sundstrand cost-cutting products.



No. 56 illustrated, others available. Fast, accurate, an operation saver, a mighty profitable investment.

BENCH CENTERS



**CENTERING
MACHINES**

Accurate, compact, portable. Adjustable heads. Quick-acting spindle. Seven sizes.



These Sundstrand tools, like our Lathes and Milling Machines, cut costs and make work easier. • • •
INVESTIGATE! Address our Dept. H for details.

The New 1-B, $\frac{1}{4}$ " Capacity (5/16" Chuck)
2-B, $\frac{3}{8}$ " Capacity ($\frac{1}{2}$ " Chuck)

Replacing the No. 1 and 2 ETTCO Tappers

Ettco - Emrick

TAPPING ATTACHMENTS

Here's Speed, Long Life and Satisfactory
SENSITIVE TAPPING



Here's fifteen years experience with the old No. 1 and 2 wrapped right up in efficiency.

The **BALL BEARING SPINDLES** and Needle Bearing quills, with all **HELICAL GEARS** tell their own story.

The **NEW LEATHER CLUTCH** in the form of shoes or segments just about doubles the clutch life.

And besides—there is that ideal about a leather clutch, for medium tapping, for which we have found no substitute.

THE TAP IDLES "IN"—NOT REVERSE. It's about time somebody incorporated this tap and work saving feature,

Write for New Bulletin covering all seven sizes of ETTCO Tappers

ETTCO TOOL CO.

596 Johnson Ave.,

BROOKLYN, N. Y.



OUT with broken bolts even while equipment is running

REVOLUTIONARY new **RIEID** "LonGriP" Extractors prevent expensive shut-downs and time losses when a screw or bolt breaks. Many times they remove the broken threaded end while equipment is running.

They do a safe precision job: companion drills and drill guides hollow out broken end to a thin shell; then straight flute "LonGriP" is driven in, flutes gripping shell full length—it has to turn out. No slipping, reaming, expanding or wedging as with conventional tapered spiral extractors. No danger of damaging threads or breaking extractor.

Time and trouble saved on the first job will more than pay for your "LonGriP" Extractors. Come in sets, extractors with drills and drill guides for each size screw or pipe, 1/32" to 3".

Ask your Jobber, or write for folder.

The Ridge Tool Co., Elyria, Ohio, U.S.A.

RIEID
LONGGRIP
STRAIGHT-FLUTED
SCREW AND PIPE  **EXTRACTORS**



Valley Ball Bearing

Bench and Pedestal Type Grinders

For Heavy Duty Service



The illustration shows:

The New Valley Long Shaft Heavy Duty Ball Bearing Grinder. This design provides AMPLE ROOM FOR TWO OPERATORS.

Valley Grinders are powered by Valley Ball Bearing Motors—Truly, a one Profit Product—Giving you a Guaranteed Grinder at a Low Cost Price.

VALLEY'S 24 years experience in designing and manufacturing grinders is the background for the Exceptional High Quality Valley Grinders of today.

$\frac{1}{4}$ H. P. to 5 H. P. in bench and pedestal types.

Write for our New Bulletin No. 10

Valley Electric Corporation
4221-27 Forest Park Blvd., St. Louis, Mo.



Patented

**By
Stacking in**

STACKRACKS You Save Space, Time and Labor

The STACKRACK is just the thing on your assembly floor, in your machine shop, under workbenches for perfect "stock control". With STACKRACKS you will be able to stack materials at the point where they are the most needed without wasting valuable space. And besides they will eliminate the "stockroom parade" which is wasting employees' time.

With the STACKRACK boxes and pans are always in an orderly arrangement—neatly stacked one on top of the other—each unit being completely accessible without disturbing other units. STACKRACKS are made in single units each constructed of angle and formed steel, welded together. Each rack automatically locks in position on the rack underneath.

Don't pass up this opportunity to learn how you can better your storage problems by using STACKRACKS for greater plant efficiency.

P. S.

When writing be sure to specify sizes of boxes to be stacked and approximate weight of contents.

**STACKBIN
CORP.**



*"Stacked and
still accessible"*

PROVIDENCE, R. I.

HERE'S THE ANSWER TO MANY A TOUGH OPERATING PROBLEM

An All Purpose Flexible Shaft Machine . . . light, portable, economical . . . a high speed performer, that cuts costs and increases plant efficiency.



An answer to the problems of grinding, finishing, polishing, and similar operations. Quickly changed over from one operation to another. The great utility of Haskins equipment has won the acclaim of production chiefs and operators in thousands of plants in every major metal working industry. R. G. Haskins Company, 4654 W. Fulton Street, Chicago.

Write today for illustrated booklet showing many different models and scores of unusual adaptations.

Haskins

FLEXIBLE SHAFT EQUIPMENT
with Greater Adaptability

KRW Hydraulic and Sensitive ARBOR PRESSES

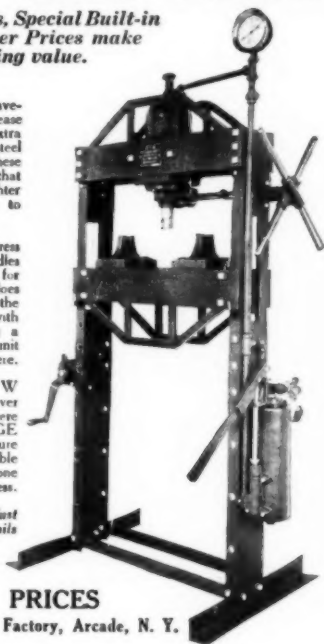
New Improvements, Special Built-in Features and Lower Prices make them an outstanding value.

THE last word in convenience, efficiency and ease of operation. Built extra strong and well braced, with steel trusses electrically welded, these presses will withstand strains that would cause presses of lighter and inferior construction to buckle or collapse.

Hand wheel for sensitive press operations has sliding handles which pull out to the ends for increased leverage. Work does not have to be changed from the work table as is the case with other make presses having a separate sensitive press unit mounted on the side or elsewhere.

The importance of this KRW feature as a time and labor saver can be appreciated. Also there is **NO EXTRA CHARGE** for this important built-in feature on a KRW Press. Work table can be raised easily with one hand. A strictly one-man Press.

Write for special circular, just off the press, giving full details and specifications of all KRW Arbor Presses.



PRICES

F. O. B. Factory, Arcade, N. Y.

No. 37—35 ton Hydraulic and Sensitive Arbor Press	\$135.00
No. 37E—50 ton Hydraulic and Sensitive Arbor Press	164.00
No. 37F—70 ton Hydraulic and Sensitive Arbor Press	275.00

Gauge and fittings, \$15.00 extra on all presses.

K. R. WILSON

10-16 Lock Street, Buffalo, N. Y., U.S.A.

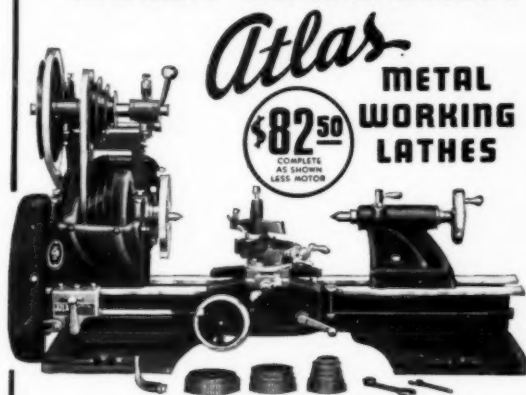
EXPORT DEPARTMENT

90 West St., New York, N. Y.

WEST COAST BRANCH

722 Mateo St., Los Angeles

NEW! MODERN!



★ MODERN DESIGN ★ MODERN CONSTRUCTION

The new Atlas lathes were designed and built to give more value—accuracy—efficiency and satisfaction than ever before during the 25 years Atlas has been building precision shop equipment. The back-gear model shown has 36" bed, 10 $\frac{1}{4}$ " swing, and takes 18" between centers. Accurate to .001" for those precision jobs in manufacturing, tool room, or laboratory. Can be fitted with attachments for all machine shop operations.

Other new Atlas metal lathes priced from \$35.50 up. Sold on monthly payments if desired. 2 weeks trial. Money back guarantee. Send for latest catalog of metal and wood working lathes, drill presses, tools, and attachments—illustrating today's outstanding equipment values.

ATLAS PRESS CO., 550 N. Pitcher St.
Kalamazoo, Mich.

Complete Displays at:

CHICAGO **NEW YORK** **PHILADELPHIA**
35 E. Wacker Dr. 130 W. 42nd St. 113 N. 3rd St.

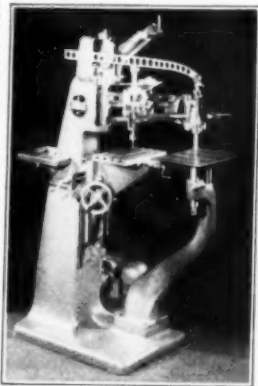
NEW MACHINES FOR DIE AND MOLD CUTTING

The George Gorton Machine Co., 1115 13th St., Racine, Wisconsin, has added 3-dimensional machines in two sizes, to their line of Pantograph machines for engraving and die and mold cutting. These new 3-dimensional machines are adapted for cutting all kinds of dies and molds having ornamental designs, lettering, etc., such as die-casting dies, and glass, plastics and small rubber molds.

The Gorton line of die duplicators reproduce direct from an original in 1 to 1 ratio, not enlarging or reducing. These new pantograph machines supplement the Duplicator line, by reproducing in *reduced ratio*, direct from models of any shape or contour. This makes possible the production of dies in almost any desired size, from one model. These new machines will also do any of the work accomplished with older type Gorton 2-dimensional pantograph machines.

The new machines will reproduce from models of stone composition, bakelite, hardwood, etc., or from metal templates and master copies. Reproduction ratios range from one-half to one-eighth size of model or master. The machines possess several important advantages not found in competing foreign machines of the same type. The most important one is that cutter spindle and tracer are always *truly vertical* with relation to work. Depth of cut is *not* obtained by hinging the pantograph, thus causing an under-cut on one side of a deep mold.

Uniform pressure of tracer against model is maintained at all pantograph positions because the Gorton design eliminates the need for a counterweight to bal-



FRONT VIEW OF 3-B PANTOGRAPH MACHINE

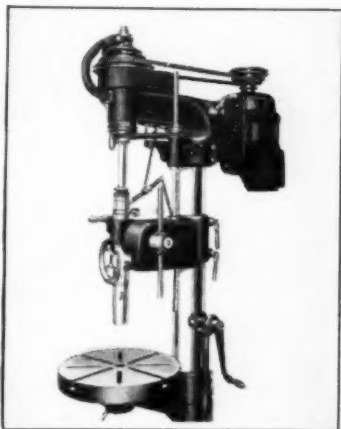
(Continued on Page 22)

This Unusual Value

only
possible

BECAUSE

The powerful Buffalo No. 22 Drill shown here was built to provide a large capacity, highly-accurate production drill at a low price. This was made possible by de-



signing a machine without the "frills" so commonly associated with drills of this type.

The result is a substantial, safe, accurate machine tool, suitable for 95% of the work encountered in the average shop, practical in every sense of the word—and lower in price than any drill of comparable quality!

Write for Bulletin 2989

You will want full details on No. 22 Drills before you buy any drilling machinery. Write for 8-page bulletin today.

BUFFALO FORGE COMPANY

161 Mortimer St.,

Buffalo, N. Y.

In Canada: Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

ance the pantograph. This construction also provides easier operation, because operator does not have to lift and hold pantograph against the thrust of cut in two directions. Gorton machines also provide larger work holding capacity and an unobstructed view of the cutter at all times.

The machines are accurately made for precision work. They have high speed spindles mounted on super-precision ball bearings. All pantograph joints are ball bearing, as are the motor drive parts. Table, saddle and knee are of a simplified, conventional milling machine type, with hand feeds. Machines are furnished complete with motor mounted and ready for operation.

Materials used are only the very best. Castings are nickel semi-steel, normalized. Spindle parts are alloy steel, hardened and ground all over. Flat surfaces accurately hand scraped to surface plates, pulleys dynamic balanced. Chip guards, dust seals, etc., are provided thruout.

The 3-B (small size) will cut a maximum size cavity 6"x12", and almost any depth, in one setting. Larger work can be reset. The 3-B takes cutters to $\frac{1}{4}$ " dia. with six spindle speeds, 3800-9900 r.p.m. driven by $\frac{1}{4}$ h.p. motor. Net weight is 850 lbs.

The 3-L (medium size) will cut a maximum size cavity 9"x18" and almost any depth, in one setting. Larger work can be reset. The 3-L takes cutters to $\frac{3}{4}$ " dia., and has nine spindle speeds 1100-9200 r.p.m. driven by $\frac{1}{2}$ h.p. motor. Net weight is 2100 lbs.

A NEW METHOD OF PREPARING SAFETY BELT HOOKS

The sectional illustration shows the new and improved manner of preparing Safety Belt Hooks for box packing.

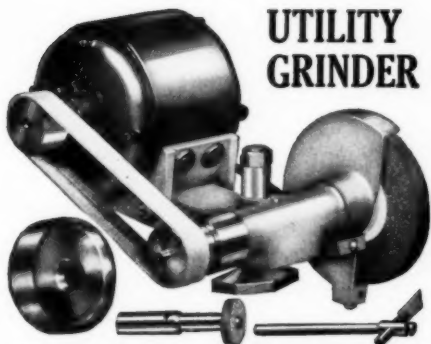
In between each row of points a strip of cardboard is inserted which has the



effect of giving each strip of hooks a flat bottom. Thus, no matter how much a box of hooks is jostled about in transportation, nor how hurriedly they are handled in the shop, each strip remains apart from the others, avoiding all tendency to telescope or engage in the box. It is re-

(Continued on Page 24)

UTILITY GRINDER



Complete as above \$65.00

EXTERNAL or INTERNAL GRINDING on a Lathe, Shaper or Planer. Make your old Tool and Cutter Grinder a self contained unit, replace the spindle head with a Utility Grinder, also can be adapted to internal Grinding Machines.

MOTOR—Constant speed, $\frac{1}{4}$ H. P., heavy duty, Ball Bearing 3500 R. P. M. No metal contact between motor and bracket. Rubber insulation absorbs motor vibration.

GRINDING SPINDLE—Alloy steel, standard precision ball bearings, spindle adjustment automatic regardless of temperature.

E-Z SET BORING TOOL



Made in 3 Sizes

\$13.50 to \$27.50 with shank and bit.

COMPACT, RIGID. Small body, large boring capacity. Adjustment actuated by a worm. Straight or taper shank. Adjustable to Jig and Fixture, Production or Maintenance work.

See your dealer or communicate direct with us.

Sold on a Money Back Guarantee

F. A. MAXWELL COMPANY
386 Broadway Ave., BEDFORD, OHIO

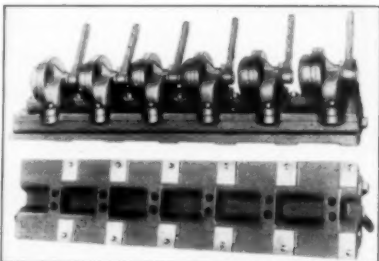
ported that in many plants a partially used box of belt hooks, not connected with Steel Binder Bars, such as feature Safety Hooks, is often found in a confusing and wasteful mess. It is contended that with this new method of packing, a partially used box of Safety Hooks may easily be kept in neat condition. Dealers report this new feature much appreciated.

For further information write to the Safety Belt Lacer Co., Toledo Factories Building, Toledo, Ohio.

NEW MANIFOLD VALVE

**For Control of Compressed
Air or Hydraulic Equipment**

Hannifin Manufacturing Company of 621-630 South Kolmar Avenue, Chicago, announce a new and improved type of "Packless" Manifold type air control valve, of unusually



compact construction and arranged for simple piping installation.

The valve illustrated is for control of six double active air cylinders from a single point. Other types are available for control of any number of air cylinders, or air or hydraulic equipment of any other type.

The base of the Hannifin Manifold Valve is one piece, with inlet and exhaust ports at the ends, and cylinder ports in the bottom. Piping can be arranged in the simplest manner with minimum number of connections. Inlet and exhaust connections can be made at either end of the base. Manifolds can be furnished with any number of valves required.

Hannifin "Packless" Air Control Valves are of simple, efficient design, with minimum number of parts, and no packing whatever. The bronze disc which controls the air flow is ground and lapped to make a perfect seal

(Continued on Page 26)

ANNOUNCING!— RED HEAT STELLITE CENTERS

Manufactured by Scully-Jones

LONG LIFE, HEAT RESISTING, LOW COST



ORDER A SET FOR YOUR TOUGHEST JOBS

No. 1	MORSE TAPER STELLITE CENTER	\$1.75
No. 2	" " " "	2.50
No. 3	" " " "	3.25
No. 4	" " " "	4.75
No. 5	" " " "	9.25

JARNO, BROWN & SHARPE AND SPECIALS. PRICES ON REQUEST.

STELLITE END SWAGED ALLOY BODY

Circular No. 70 Gives Complete Information

SCULLY-JONES & CO., 1909 So. Rockwell St.,
CHICAGO, ILLINOIS

Now a BLUEPRINTER



For The Small User

If you use Blueprints and often want them in a hurry, the BLUE-PRINTER will do it for you.

If you are seldom rushed for prints but want to cut down Blue-printing Costs the BLUE-PRINTER will do that too.

*Complete details in
illustrated folder.*

MILLIGAN & WRIGHT CO.
1243 West Third St., Cleveland, Ohio

with the seat, which is similarly finished. This effective design prevents leakage and maintenance troubles. The disc and valve seat are restored to original efficiency by simple re-lapping at infrequent intervals.

Manifold valves are available in 3-way and 4-way types. Type MK has 45 degree movement, no shut-off position, air being admitted at all times to one side or the other of the air cylinder. Type MV has 90 degree movement with outlets open to exhaust when lever is in shut-off position. Type MP has 90 degree movement with outlet and exhaust ports closed when lever is in shut-off position.

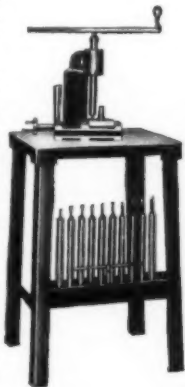
Besides its use for control of compressed air and hydraulic equipment, the manifold valve is ideally suited to the control of fluid and gas handling and pumping operations, filling and emptying storage tanks, the transfer of material in chemical and refinery processes, and many similar uses.

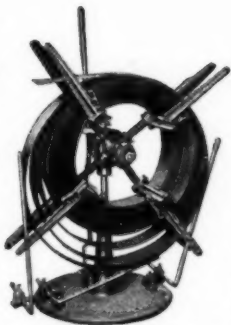
BAY STATE HAND TAPPER

A new device which is intended to make the tap wrench obsolete, has been announced by the Producto Machine Company, Bridgeport, Conn. By making taps quickly and easily the Bay State Hand Tapper is claimed to cut direct hand tapping labor costs 75 per cent.

It has a tap capacity of $\frac{1}{8}$ " to $\frac{3}{4}$ ". A bracket extending 9" from the top of the table, which measures 16"x20", houses a spindle 1" in diameter by 11" long. The complete weight of the machine without the spindle is 135 pounds. The Bay State Hand Tapper is easy to operate, and requires no setting whatever. The work is placed on the table against the stop pan, a spindle with the desired size tap is inserted into the bracket sleeve, and the work is completed by merely turning a crank.

The accuracy of the tap is governed by the spindle sleeve, which holds the spindle rigidly at all times. Another advantage claimed for the Bay State Hand Tapper is that it decreases spoiled work, reducing periods of delay.





Coiled Stock
Can be
Handled
Most
Efficiently
with
Littell Automatic
Centering Reels

Littell Automatic Centering Reels enable one man to load and center heavy coils in less than two minutes regardless of the difference in inside diameters between one coil and the next. Centered coils turning on ball bearings revolve with the greatest of ease. This condition means greater production for both hand feeding and automatic feeding of coiled stock.

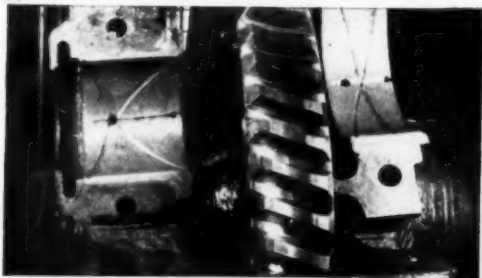
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Mfr's of Punch Press Feeds and Reels

TIMESAVER LAPPING COMPOUND

Produces

PERFECT FITS—QUIET OPERATION



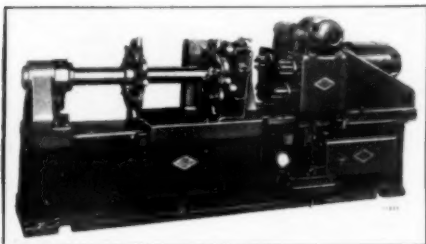
For fitting gears, bearings, slides, pistons, etc.
WILL NOT IMBED OR CONTINUE TO CUT

Send for samples and literature.

TIMESAVER PRODUCTS CO., 33 So. Desplaines St.
CHICAGO, ILL.

ROCKFORD DRILLING MACHINE COMPANY ANNOUNCE A NEW HORIZONTAL MACHINE

(Corrected from last issue)



The Rockford Drilling Machine Co., Rockford, Ill. (Rockford Drilling Machine Division of Borg-Warner Corporation) have recently developed the Horizontal Drilling Machine shown in the illustration, with automatic hydraulic operating cycle.

This new machine is equipped with a 5-station fixture and tooling for performing the following operations on the flange of a large crankshaft:

Station 1—Load and unload work-pieces.

Station 2—Drill 6 holes, and mill out center of flange.

Station 3—Drill 2 locating holes.

Station 4—Countersink 6 holes, and ream 2 locating holes.

Station 5—Tap 6 holes.

This machine has a large base containing the hydraulic equipment with centralized control, coolant pump, and reservoir. Mounted on the right hand end of the bed is a traveling head having automatic hydraulic cycle of rapid approach, feed, dwell for fine finish on milling and countersinking, rapid return, and stop. Easily adjusted dogs on the lower edge of the traveling head govern its automatic operating cycle. Manual control for setting up purposes is provided by a conveniently placed lever. A central push button station provides the operator with complete control of the machine and enables him to stop it instantly at any point in its cycle. If the machine should

(Continued on Page 30)

SPEED LATHES

Timesavers for your plant



Hand, foot or air operated 3-jaw chucks.

Hand or Foot operated collet, sizes from $\frac{1}{8}$ " to $1\frac{1}{4}$ ".

1, $\frac{1}{2}$ or $\frac{3}{4}$ h. p. AC 2 speed motor.

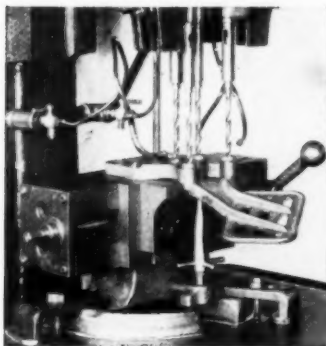
Steel bed plate or hand rest optional.

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Cir. 351 Today

**Just the tools for Finishing,
Polishing or Lapping of
small parts.**

THE very tools you've been looking for to produce those small parts quickly and economically. Eliminates tying up larger equipment with its slow and make-shift production methods. Built-in features of this new tool allow you to handle rod, tube and chuck stock better than ever before.

Schauer Machine Co.
9th & Broadway, Cincinnati, Ohio



"JOHN'S" UNIVERSAL DRILL JIG

Jaws and bushing plates are all you need to make your permanent drill jigs.

The "John's" Jigs provide a base with quick clamping action for an unlimited number of drill jigs — thereby cutting future jig cost 75% in most cases.

MADE IN 3 SIZES

Write for Literature

HEUSER MANUFACTURING CO.

1638 N. Paulina St., Chicago

be stopped for any reason, the taps automatically rotate correctly when operation is resumed.

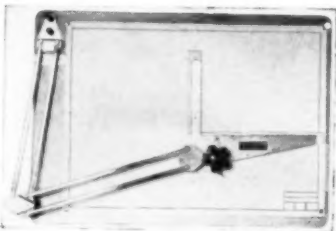
On the front of the head is a detachable plate containing the 23 spindles arranged in four clusters. This construction makes it possible to adapt the machine to engineering changes in work-pieces, or to use it for many other kinds of work merely by making suitable changes in spindle arrangement, tooling, and work-holding devices.

At the left of the traveling head is the 5-station fixture in which two work-holding heads are mounted on a heavy central shaft that rotates in anti-friction bearings for easy indexing. These bearings are contained in two heavy supports accurately aligned and solidly secured to the machine bed. The combination of a 5-station fixture with locating gage, simultaneous operation on 4 work-pieces, and automatic operating cycle results in high production limited only by the longest operation, which is drilling six $37/64$ " holes, $1-9/16$ " deep.

The same operating advantages and patented features that are embodied in this machine are also available in other Rockford Drilling Machines of horizontal, vertical, and "way" types for drilling, tapping, boring, and similar operations on a wide variety of work.

"Wrigraph" DRAFTING MACHINE

The new Wrigraph Model E-272 (shown in the illustration) is an outstanding development in the complete line of fine Drafting Machines manufactured by L. G. Wright, Incorporated, 5711-2 Euclid Ave., Cleveland, Ohio.



It is a newly designed, streamlined drafting machine mounted on a 22"x30" cleated, white pine board. The parallel mechanism is hand-assembled with all steel nickel-plated parts and solid Phosphor Bronze Bearings. This mechanism is calibrated for accuracy and completely guaranteed. The Model E-272 is equipped with a vernier

(Continued on Page 32)

CUT YOUR COSTS NOW

By Installing an

ACE Spot Welder

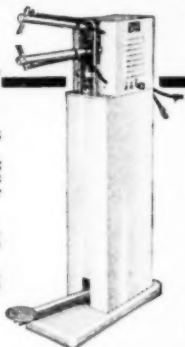
**Eliminates Bolts and Rivets
Reduces Manufacturing Costs**

Provides essentials of good welding, long and satisfactory service. Built for fast production. Equipped with many labor saving features.

Model 60. 12" Throat, welds up to 2 pcs. 16 ga. Steel, price complete **\$75**

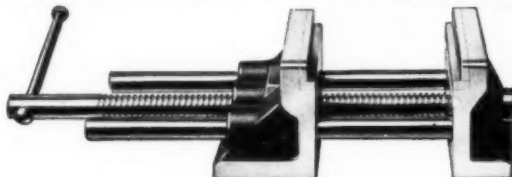
Model 80. 18" Thr., welds up to 2 pcs. 18 ga. Steel, price compl. **\$135**

*Literature and sample welds
upon request*



PIER EQUIPMENT MFG. CO.
604 Cross Street, Benton Harbor, Mich.

A Drill Press Vise —with— Built-In Parallels



No interference from chips or burrs; can be used from three sides. Save time and reduce costs on drilling operations. Two inches clearance for through drilling. *Send for illustrated circular.*

NATIONAL MACHINE TOOL CO., Racine, Wis.

indicating protractor reading to degrees. The protractor unit has a unique chuck plate to hold the new streamlined drawing attachments in perfect alignment. The graduated L-Square blade is made of pyroxylin and riveted to a lightweight aluminum stiffener which has been given a satin finish to eliminate glare. The drawing edges of this blade are transparent.

This professional model was developed to fill the need by technical men for a moderately priced, accurate drawing machine making drawings up to 20"x26".

If you have your own board, the machine may be obtained with a special base plate to easily fasten to any flat wood surface, without screws or clamps.

NEW "BLUEPRINTER" DEVELOPED

A handy machine for use in any shop needing even as few as five blueprints a day has been developed by the Milligan and Wright Company, 1243 West Third Street, Cleveland, Ohio. The new "Blueprinters" claim the advantages of simplicity of operation, rapidity in printing and greater economy.

An outstanding feature of these new "Blueprinters" is the use of incandescent lamps instead of carbon arc lamps which have been a necessity for blueprinting. By using these lamps, fumes are disposed of and the work can be placed closer to the light source, thereby lowering the exposure time. There are no maintenance costs except replacing the lamps when they are burnt out. The incandescent lamps have been specially developed to fit these machines in order to make blue prints as quickly and cheaply as possible.

All models of the new "Blueprinter" have a horizontal plate glass working surface and loading is merely a matter of placing a drawing sheet on the glass with a ready-cut piece of blueprint paper over it. They are held in close contact with the glass by pressure pads and a spring cover. Light sources come from the specially designed Angstrom incandescent lamps, six to twelve lamps to a machine, depending upon the size. Only sixty or ninety seconds are required for most drawings, depending upon the transparency.



(Continued on Page 34)

Sheldon Arbor Presses



Sheldon Milling Machine
Vises.

Sheldon Drill Press and
Shaper Vises.

Sheldon 90° Angle Plates.

*Write for illustrated
price list.*

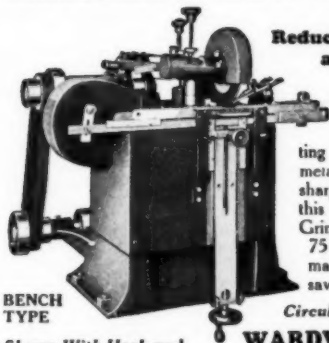
Sheldon Machine Company

3255 Cottage Grove Ave.,

-:-

Chicago, Ill.

WARDWELL MODEL E-C Automatic Saw Sharpener



**BENCH
TYPE**

*Shown With Hack and
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and Increase Your
Cutting Speeds**

Power hack saws,
metal and wood cut-
ting band saws, all types of
metal cutting circular saws,
sharpened automatically in
this improved Wardwell
Grinder, at a speed of 30 to
75 teeth per minute. The
machine accurately sharpens
saws as fine as 32 teeth to 1".

Circular Free Upon Request

WARDWELL MFG. CO.
3165 Fulton Rd.: Cleveland, O.

There are two sizes of "Blueprinters", a bench model and a table model, both 18"x24". They are made of welded steel and include a new forced draft ventilating system. There is one deep tank arranged for running water, one shallow tank and four drying boards, all sliding in under the base. Outside dimensions are 26"x30½"x49" high. For complete information address the manufacturer.

EISLER WELDING BOOKLET

No. 36W

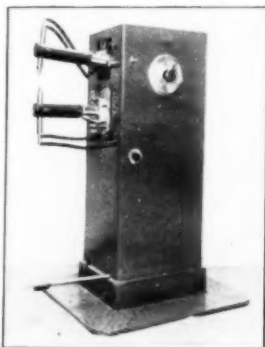
"Electric Welding Machines and Welding Tips" is the title of a 64-page reference book on resistance welding just published by Charles Eisler of the Eisler Engineering Co., 750 So. 13th St., Newark, N. J., for the benefit of users of Eisler spot, butt and seam welders.

In this booklet, containing over one thousand illustrations and diagrams, are shown hundreds of special welding problems that have arisen in various lines of industry all over the world during the past fifteen years.

The adaptability of resistance welding and its constantly increasing field of application in various industries is thoroughly demonstrated therein.

Many new types of welding equipment, recently developed by the company are shown, including a new line of box type spot welders one of which, the 50 K.V.A. size, is illustrated here.

The Eisler Welding booklet will prove valuable to the executive or engineer interested in the furtherance of economy in his plant by means of welding. If you are using or planning to use electric welding, write to the Eisler Engineering Co., 750 So. 13th St., Newark, N. J., on your company letterhead mentioning your interest, and a copy of the booklet will be sent you.



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**Grinding, Sanding,
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They save time and speed up production. A type and size for every job!

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Keep Stock Where You Can Get At It EASILY—on the



HANDIEST RACKS

Hundreds of concerns are using these Handy Racks to service machines as well as for storage purposes. Take up little room and keep pipe, shafting, bar stock, etc., neatly piled and assorted as to size. Placed beside machines they save operators from time wasting "stockroom trotting". Ideal for storage as they fit in any available space and you can instantly check stock on hand with a glance. Can be used singly, back-to-back (as shown herewith) or staggered. Try a set in your shop—you'll be glad you did!

Write for Details of our FREE TRIAL Offer

WM. S. YOHE SUPPLY CO.

503 Mahoning Road, N. E.

CANTON, OHIO

PROCUNIER HIGH SPEED TAPPING ATTACHMENT

The Procunier Safety Chuck Company, 14 South Clinton Street, Chicago, Illinois, announces a new High Speed Friction Tapping Attachment which is equipped with a new type of tap holder that is claimed to considerably increase tapping accuracy. Due to the extreme lightness of the new Tap Holder, the flywheel effect is reduced to the minimum. The weight of the new Tap Holder is only 2½ ounces, including the spring collet and chuck spindle.

The new Tap Holder is claimed to be the smallest and lightest of its kind. It is hardened and ground to assure durability and accuracy, and incorporates the use of spring collets, one for each size of tap shank. The largest diameter is only ¾" round, and the chuck spindle and tap holder is all one piece to insure accuracy and strength. The smallness of the new Tap Holder permits precision tapping very close to any shoulder which may be present on the part being tapped, and which might otherwise interfere. The extreme smallness also provides for clear vision without stooping or sitting. Other advantages claimed for the new Tap Holder are: less tap breakage, more sensitive, decreased wear on tapping attachment mechanism, and no protruding parts to catch operator's clothing.

The tapping attachment mechanism is enclosed in an aluminum housing with the steel parts made as light as



(Continued on Page 38)



Hartford Taper Gauge

Locates Inaccuracies Instantly

When turning tapers on end mills, profile cutters, twist drills, reamers, lathes, etc., accuracy is all important. The Hartford Taper Gauge enables the workman to tell instantly whether a taper is right.

Simple—Inexpensive—Reliable

Any inaccuracy down to .001" can be instantly detected. Adjustable over a wide range—from No. 0 to No. 14 taper.

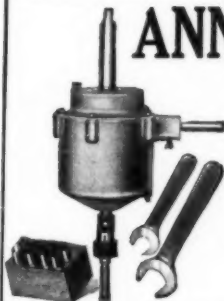
Write for Complete Details and Price

**We Also Build Machinery on a Contract Basis
And Design and Develop Special
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Gears and Cams Cut To Order

Hartford Special Machinery Co.

285 Homestead Ave., Hartford, Conn.



ANNOUNCING

A NEW "PROCUNIER"

SENSITIVE HIGH SPEED

TAPPING

ATTACHMENT

WITH OUR NEW

"TRU-GRIP"

TAP HOLDER

SMALLER — LIGHTER — MORE ACCURATE

Send for your copy of entirely new literature just off the press

PROCUNIER SAFETY CHUCK CO.

14 So. Clinton St.,

CHICAGO, ILL.

possible. Precision ball bearings provide accuracy and rigidity. The reversing mechanism is of the planetary type, having three balanced heat treated intermediate gears which transmit reversing power from a heat treated ring gear attached to the drive shell, to a hardened reversing gear which operates on a ball bearing. A double-cone, cork-faced friction clutch provides a powerful, yet sensitive, friction drive and reverse, engaging very smoothly with the conical surfaces of steel drive and reverse shells. The special cork facing is cemented to the hub of the clutch, and is practically indestructible. Bottom tapping can be accomplished as easily as through tapping.

The new Tap Holder is available in the new "Procurier" High Speed Tapping Attachment which lists a capacity of No. 2 tap to $\frac{3}{16}$ " in Steel, $\frac{1}{4}$ " in Brass and Cast Iron.

NEW VALLEY LONG SHAFT HEAVY DUTY BALL BEARING GRINDERS



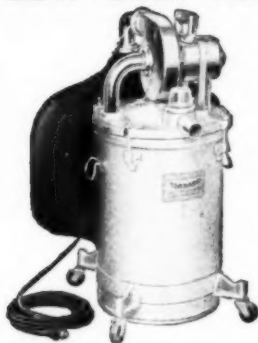
These new heavy duty Grinders are made $\frac{1}{4}$ H.P. to 5 H.P. in floor and pedestal types, for 10", 12" and 14" wheels.

The power is supplied by Valley ball bearing motors, and the long shaft gives ample room for two operators.

Some of the features are: inclosed guards with exhaust outlet; spark shields adjustable to wear of wheel; adjustable tool rests to angle, vertical and lateral positions; inclosed motor; dust proof ball bearings; heavy shaft, free of vibration, etc.

This new machine is the culmination of Valley's experience of 24 years in designing and manufacture of Grinders. A full description may be had by writing to Valley Electric Corporation, 4221 Forest Park Boulevard, St. Louis, Mo., for Bulletin No. 10.

FOR THE FIRST TIME !! LOW COST PLANT CLEANING



with Breuer's Ball Bearing

TORNADO

**Portable Industrial
Vacuum Cleaner**

Great Cleaning power (46 $\frac{1}{4}$ " waterlift) combined with light weight (only 40lb.) and sturdy construction make it possible to clean floors, walls, ceilings, overhead pipes, machinery, etc. at less than $\frac{1}{2}$ the cost of other methods. Also ideal for salvaging metal dust, filings, etc. Motor unit easily detached for blowing.

Write for free trial offer

Breuer Electric Mfg. Co.

846 Blackhawk St., Chicago, Ill.



*Just what you need
for Office, Factory,
Restroom, etc.*

**4-SECTION
ALL-METAL
LOCKER**
(FULL SIZE SECTIONS)

\$25.00
Complete

Olive green finish, each compartment 12" wide, 15" deep and 60" high. Heavy metal construction. F. O. B. Factory.

GEORGE KOCH SONS **Evansville,
INDIANA**

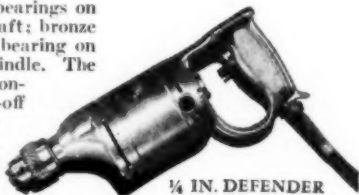
"METALCRAFTSMEN SINCE 1873"

SKILSAW INTRODUCES THREE NEW DRILLS

Once again Skilsaw, Inc., announces three new models to extend the completeness of its famous line of Skilsaw Drills. These latest additions to the line are a Special Duty $\frac{1}{4}$ in. drill and two new models to be known as Defender Drills, offering quality construction in a lower price range.

The new $\frac{1}{4}$ in. and $\frac{1}{2}$ in. Defender Drills have been developed to meet the demand for tools that are inexpensive, yet can give years of satisfactory service. They embody many engineering and construction features which have never before been offered in the low price field. The motor construction is identical with that in the regular, higher priced Skilsaw Drills—there is a greater than usual overload tolerance, which adds to the life of the motor and assures cool running. Gears are made of special alloy steels, helical cut for quiet operation. The frame—like on Skilsaw Drills—is a die cast aluminum alloy which is lighter, stronger and more durable than the conventional cast aluminum. Each model is fitted with a finest quality 3-jaw geared chuck and key.

The $\frac{1}{4}$ in. Defender has Oilite and ball bearings on the armature shaft; bronze and ball thrust bearing on gears and spindle. The switch has a convenient on-and-off mechanism, enclosed in a bakelite housing. This model is 12 in. long overall and weighs only



$4\frac{1}{4}$ lbs. It sells for only \$19.50. The $\frac{1}{2}$ in. Defender is a marvel of compact construction and light weight for a drill of this capacity and it sells for only \$35.00. It is only $13\frac{1}{2}$ in. long overall, weighs only $9\frac{1}{4}$ lbs. and is ideal for close corner work because it measures only $1\frac{3}{8}$ in. from the center of spindle to the outer edge of the frame. This model has Oilite and ball bearings on the armature shaft; Oilite bearings on the intermediate gear and spindle. The switch is a double pole, momentary contact type with a lock for continuous operation, enclosed in bakelite

(Continued on Page 42)

1905

Strand

1936



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**LEADERSHIP
FOR
THIRTY ONE YEARS
IN THE BUILDING OF
FLEXIBLE SHAFTS and MACHINES**

**-WHY-
BECAUSE QUALITY NEVER FAILS
HORIZONTAL and VERTICAL TYPES
1/2 to 2 H. P. CAPACITY**

USED FOR
Grinding—Polishing—Reaming—Drilling—Rotary Filing—
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Operations on Metal and Wood.

Distributors in all industrial Centers of the United States.

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in their line—Head rivets
from smallest to 3/4" diame-
ter either by NOISELESS
SPINNING or VIBRAT-
ING HAMMER method—
Sizes to meet all needs—
Types include Vertical and
Horizontal Multiple
Spindles.

*Write for literature—and
don't forget to send
samples.*



The Grant Mfg. & Machine Co.
C. E. Station, Bridgeport, Conn.

to prevent dust, dirt and metal chips from accumulating on contact points.

The new Model 40 SKILSAW Drill has a $\frac{1}{4}$ in. capacity in steel. It is classified as a special duty tool—ideal for production drilling in light metals and for intermittent drilling in steel and cast iron. It has highest quality ball bearings

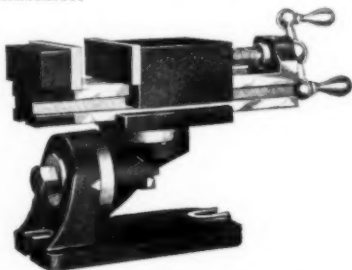


MODEL 40

mounted in all positions on armature and spindle—an unusual construction feature when you consider that this drill sells for only \$28.50. The powerful motor has greater overload capacity to insure cool running and longer life. Gears are of a special alloy steel, helical cut for durability and quiet operation. The motor shaft and spindle are of chrome nickel steel, heat treated for greatest hardness.

COVEL ANNOUNCES NEW VISE LINE

Covel Manufacturing Company of Benton Harbor, Michigan, have entered into production on a new line of precision Vises. They include plain, swivel, tilting and universal models in a great number of sizes. A full description of these Vises can be had by writing directly to the manufacturer.



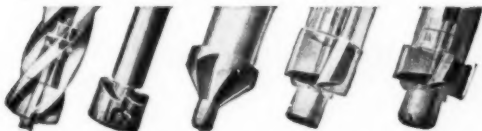
The illustration shows a "Type D" Horizontal Uni-

(Continued on Page 44)



A Complete Line

Counterbores and Countersinks, Counterbore Sets, Spotfacers, Coredrills, Reamers, Hollow Mills, Full Floating Holders, Facing Heads, Form Cutters, Boring Bars, Boring Heads, Adjustable Extension Holders, Multi Diameter Tools.




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THE GAIRING TOOL CO.

1635 West Lafayette Blvd.,

Detroit, Michigan



Standardized set-up appliances

Why force your men to waste time on machine tool table set-ups when CAD standardized appliances will convert this non-productive time into productive labor?

**STANDARD SHOP
EQUIPMENT CO., Inc.**
Set-up appliances for machine tools
8135 Tincum Ave., Phila., Pa.

versal Vice which can be locked into any predetermined combination of angles by means of the horizontal adjustment at the top, and vertical adjustment below. The complete top is easily detached.

The capacity of this Vice is 4 in. and with the jaws removed will handle stock up to 5 in. The jaws themselves are of hardened steel, 4½ in. long by 1½ in. high. The total weight of this Vice is 36 pounds.

An excellent folder describing the accessories for flexible shaft machinery, such as sanding drums and sleeves, has been recently issued by the R. G. Haskins Company, 4654 W. Fulton St., Chicago, Ill. Anyone wishing a copy may receive one by writing to the manufacturer.

SELECTIVE SPEED BUFFING AND POLISHING MACHINE

The Standard Electrical Tool Company, of 1952 West Eighth Street, Cincinnati, Ohio, have added to their line of Buffing and Polishing Lathes a Selective Speed Machine on which it is possible to obtain any spindle speed required. When equipped with patented adjustable speed sheaves a spindle speed increase of 50% may be obtained with an infinite number of steps.

The machine is powered by an 1800 r.p.m. ball bearing motor. The air jacketed type of motor is recommended, although any available motor may be used. The design of this machine is of particular advantage in those districts where direct current is now in use and there is contemplated a change-over to alternating current. This machine may be installed with a direct current motor and when the current change-over occurs it is necessary only to change the electrical equipment on the buffing machine.

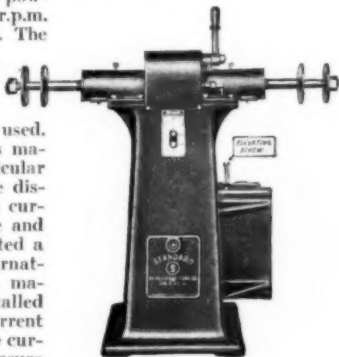


FIGURE 1

(Continued on Page 46)

Only Diamond Serrations Can Deliver Full Power of Your Screw Machines



SUTTON **DIAMOND** COLLETS GRIP

● Are the only collets that can give the gripping power of **DIAMOND SERRATIONS**. New No. 12 Catalog lists single-piece, master, and compensating Sutton Collets. Also fingers, spools, nuts, and lathe collets. Send for copy.

SUTTON TOOL CO., 2836 W. Grand Boulevard,
DETROIT, MICHIGAN



U. S. PAT.
1,992,600

ALLIGATOR TRADE MARK REG. U.S. PAT. OFFICE BELT CUTTER

By the makers of Alligator Steel Belt Lacing

You simply **PUSH** the knife through the belt. Makes a clean, square cut of any belt (except metal stitched) up to 8 in. wide. Combined guard and hold-down clamp holds belt immovable. Knife will make several thousand cuts and is readily replaceable. Used as illustrated or horizontally. Weight 4 lbs. and 3 ozs. net. Order through your distributor. \$10.00 in the U. S. A.

Sole Manufacturers

FLEXIBLE STEEL LACING CO.

4670 Lexington St., Chicago

In England at 135 Finsbury Pavement, London, E. C. 2

It will be noted in Figure 1 that a hand brake is provided for quickly stopping the spindle, reducing the time required for wheel changes. A shaft locking device further assists in changing wheels. The Push Button Station at the front of the machine operates a Magnetic Starter located inside the pedestal. The Starter has overload and under-voltage protection.

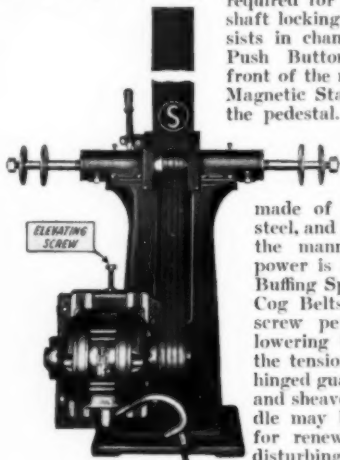


FIGURE 2

The spindle is made of high grade nickel steel, and Figure 2 illustrates the manner in which the power is transmitted to the Buffing Spindle by four "V" Cog Belts. An elevating screw permits raising and lowering the motor to take the tension on the belts. A hinged guard covers the belts and sheaves. The entire spindle may be removed intact for renewing belts without disturbing the ball bearings.

Oversize ball bearings are mounted in labyrinth sealed chambers and a sight oil feed at each bearing insures proper lubrication at all times.

This machine is made in sizes of 3, 5, 7½, 10, 15 and 20 h.p. Full details of construction and equipment may be obtained by writing direct to The Standard Electrical Tool Co.

SCHAUER SPEED LATHES FOR FINISHING SMALL PARTS

The Schauer Machine Company of Cincinnati, Ohio, are marketing a new high speed Lathe for use on the final operations of ball bearing races, headless set screws, spinning rings, shafts, screw machine products, or bur-nishing wire drawing dies and metal spinning. The machine has been especially designed for finishing, polishing or lapping of any small parts.

(Continued on Page 48)

"OHIO GEARS AND REDUCERS"

(NEW 1936 EDITION)

Send for your copy **TODAY** →

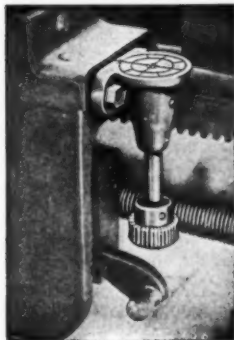


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THE OHIO GEAR CO
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CLEVELAND
OHIO

THE E-Z THREAD DIAL



For saving time and cost in cutting internal or external threads of all kinds on engine lathes, regardless of length or diameter. Cuts threads close up to shoulders. Makes a hard job easy.

The lathe need not to be stopped nor reversed until the thread is finished. Also permits increased speed, due to certainty of stopping at the desired point.

The many repeat orders have demonstrated its worth.

Made in four sizes, to attach to any make of screw cutting lathe.

Sent on 30 days' trial. Give number of threads on lead screw; state if square, V or Acme thread, right or left hand, and give distance from top of carriage to center of lead screw.

JAMES A. COLVEN

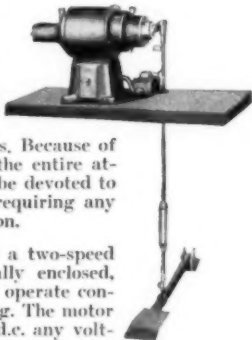
20 Wolffe Street,

Yonkers, N. Y.

The new Lathe is claimed to do away with the necessity for tying up larger and more expensive machinery; and, because they are designed to handle only small work, they are capable of producing more than the larger machines which have only makeshift provisions for turning out that class of work. Also the built-in features of the Lathe make it possible to handle rod, tube and chuck stock as well.

It is automatic in operation as the pressure on the foot pedal closes the collet on inserted stock, releases the brake and cuts off the motor. By releasing the foot pedal the motor circuit is opened, the brake is applied, and the collet opens. Because of its simplicity of operation the entire attention of the operator can be devoted to the work at hand without requiring any unnecessary manual operation.

The Lathe is powered by a two-speed $\frac{1}{4}$ or $\frac{1}{2}$ horse power, totally enclosed, dust-proof motor which will operate continuously without overheating. The motor runs at 2700-1350 r.p.m. on d.c. any voltage; and 875-1750 or 1750-3500 r.p.m. on two or three phase a.c., at 220, 440 or 550 volts.



An exclusive feature of this Lathe is an automatically applied brake which stops the motor in two seconds after the current is cut off, when running at top speed, or in one second at low speed. The brake operates against the hub of the motor spindle through an automatic type brake shoe lined with an excellent brake material. The braking action itself is positive, yet gradual, with means provided for regulating brake pressure and wear on brake shoe.

Large size bearings operating in grease are provided on both the chuck and the rear ends of the spindle, running free from dust. The motor spindle is made of high grade alloy steel, machined to run true and with proper balance. It has been designed to take various size collets from $\frac{1}{8}$ " to 1" stock as well as step chucks, special collets or holders. For further information address the Schauer Machine Company, Cincinnati, Ohio.

SUPREME *Super-Duty* SHEAR BLADES

Poorly finished, inaccurate shear blades waste set-up time, cause needless changing and re-grinding and are short lived. For these reasons it will pay you to specify SUPREME Shear Blades as *precision* plays an important part in their manufacture.

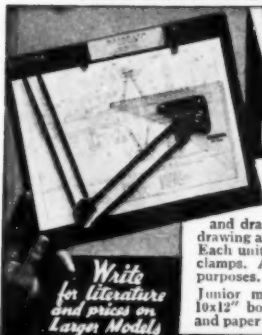
are made to order to suit your requirements—for any make of Shear. They are manufactured in Laid Alloy and High Speed Steel, as well as Solid Steel.

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WRIGRAPH—guaranteed accuracy, instrument workmanship. Brief case and drawing room models. Interchangeable drawing attachments to suit your drawing needs. Each unit is complete with a board and paper clamps. A compact machine for all drawing purposes.

Junior machine complete as illustrated with 10x12" board; parallel device special triangle and paper clamps \$5.

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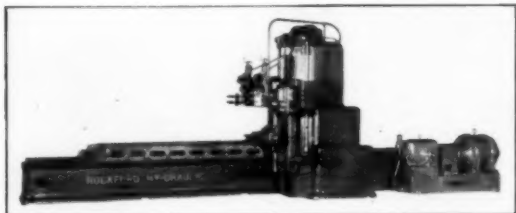
A complete line of centers featuring a high degree of "Red-Hardness" for use on high production machines has been developed by Scully-Jones & Company, 1909 South Rockwell Street, Chicago, Illinois. These centers consist of stellite ends swaged into a heat treated alloy body.

Stellite has long been recognized as a metal having the ability to remain hard even in the face of red heat. This same resistance to abrasions are built into the Centers. To obtain further information write directly to the manufacturer.

THE ROCKFORD MACHINE TOOL COMPANY ANNOUNCE NEW HY-DRAULIC PLANER

(Corrected from last issue)

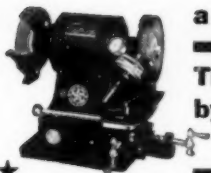
The Rockford Machine Tool Co., 2500 Kishwaukee St., Rockford, Ill., are now marketing the new Rockford Hy-Draulic Planer, illustrated below.



ROCKFORD HY-DRAULIC PLANER

This new machine was developed in response to numerous requests for a larger machine which came from owners of the well-known Rockford Hy-Draulic Shapers and Shaper-Planers, and from other sources.

(Continued on Page 52)



No Attachments

**Saves 50% of
Drill Costs.**

**Shortens Grind-
ing Time.**

**Less set-up
time needed.**

**Be sure to send
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a precision Drill Grinder

**That SAVES you Dollars
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and Spoiled Drills**

Star Precision Drill Grinder drills 81 drill sizes accurately, including 25 fractional drill sizes from $\frac{1}{8}$ " to $\frac{1}{2}$ ". It is so simple that anyone can learn to operate it in half an hour. Replace obsolete methods with an up to date machine. Powered by 115 or 220, A.C. or D.C. motor, 3,600 r. p. m.

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GENESEE**



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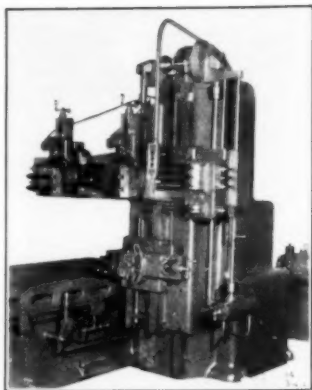
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**GENESEE MFG. CO. Inc., 141 N. Water St.,
ROCHESTER, N. Y.**

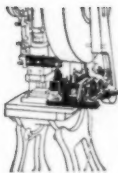
The application of hydraulic power for reciprocating a machine table has numerous outstanding advantages. It eliminates heavy reciprocating or rocking parts, joints, linkages, and gears, from the table drive. It simplifies construction and makes direct application of power most economical. It lengthens the life of cutting edges, and provides a smooth, powerful, steady cutting stroke which can be adjusted instantly to any desired rate



CLOSE-UP VIEW OF COLUMN

within the capacity of the hydraulic equipment. It eliminates "gear marks" on the work and prevents chatter. The cutting speed of the table reaches the established rate almost instantly upon reversal and remains constant throughout the entire stroke. Table reversals occur without shock in a minute period of time. The rapid return-rate of the table is constant, regardless of the cutting speed employed. The manufacturers say that by providing suitable hydraulic equipment, cutting speeds, return ratios, strokes per minute, and metal removed in any given period of time can all be much higher in the Rockford Hy-Draulic Planer than they are in machines having any other type of drive. It is claimed that, in addition, the hydraulic drive actually increases the useful life of the machine to which it is applied and reduces maintenance cost as compared to other types of drive.

Hydraulic pressure is also employed in this planer for feeding all heads. The feeds, like the cutting speeds, can be adjusted instantly to any desired amount whatever within the capacity of the machine. The feeding movement is very smooth and rapid, being completed before the tools enter their next cut.



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REEL STAND

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Standard in the greatest plants for die-setting, assembling and maintenance these superior "Soft" hammers come in many weights and sizes, with coiled Rawhide Mallets for light work and mighty Mauls for the heaviest.

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1282 Elston Ave., Chicago, U.S.A.

Chicago Rawhide Hammers

RUTHMAN ANNOUNCES NEW "GUSHER" PUMP

The Ruthman Machinery Company, 528 East Front St., Cincinnati, Ohio, have designed an easily installed pump, which can be quickly attached to the pad on the side of a reservoir by four cap screws.



Of typical Ruthman design, the pump is of the vertical type equipped with ball bearings and powered by a self-contained motor. By its simplicity elimination of extra wearing parts, valves and a steady high volume at low pressure the manufacturers claim it will deliver the highest pumping efficiency at a minimum cost. Strainers are not necessary, as sufficient clearances are allowed for any chip or abrasive materials. There is no necessity for packing, felt washers or depending close fits, as no part comes in contact with the grinding compound.

All piping around the exterior of the machine has been eliminated, thereby avoiding the necessity for drilling extra reservoir holes. The discharge pipe is internally connected, being contained within the intake. The pump automatically cleans itself when the discharge flow is throttled. Because there is no need for priming, positive gravity insures instantaneous flow.

The "Gusher" pump has twin intakes of equal size providing hydrostatic bands of the impeller and motor shaft. As there are no close tolerances for metal-to-metal contact, and an all centrifugal seal requiring no packing are particular features of the pump, the mechanism will therefore be completely unharmed by chips or abrasives.

* * * * *

An excellent guide to lower tooling costs with shielded arc-welded steel jigs and fixtures, has recently been issued by the Lincoln Electric Company of Cleveland, Ohio. The booklet illustrates dozens of adaptations of arc welding as a means of saving manufacturing costs.

* * * * *

An eight-page colored booklet recently published by the Rex Products & Manufacturing Company of Detroit, Mich., illustrates the various advantages and methods of degreasing in metal-working plants.

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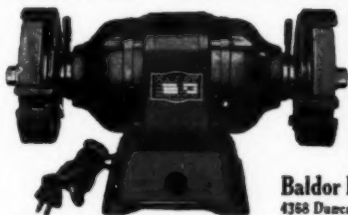
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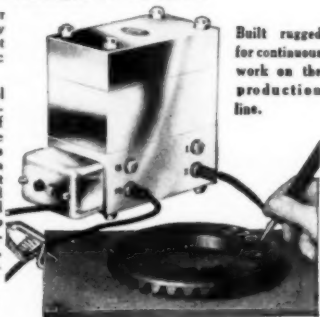
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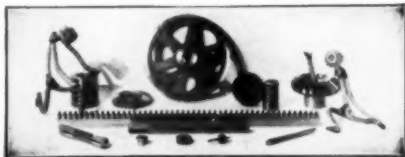
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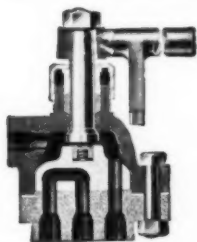
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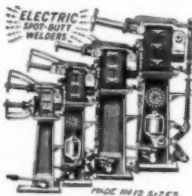
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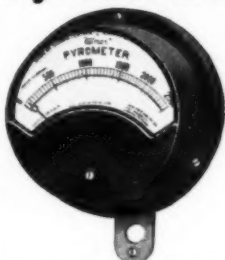
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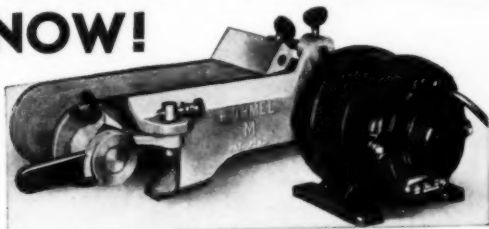
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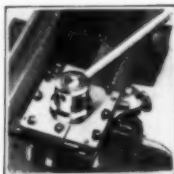
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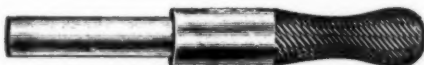
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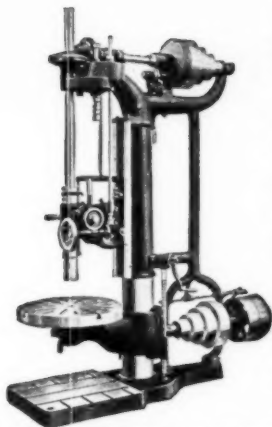
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SIZES

Stationary Head—14"-20"-21"

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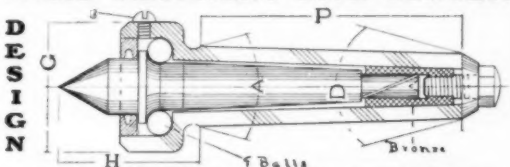
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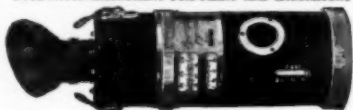
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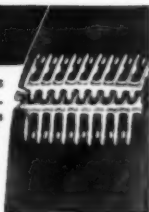


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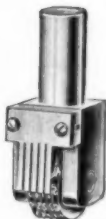
WISE

Fig. 1 With Jig
Attachments



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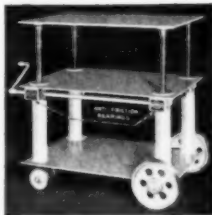
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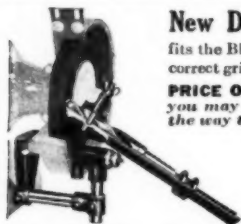
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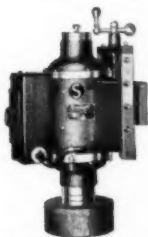
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Lewthwaite Mch. Co., T.H.311E. 47th., N. Y.

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Baumbach Mfg. Co., E. A., 1812 So. Kilbourne Ave., Chicago

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Scully-Jones & Co., 1909 S. Rockwell St., Chicago, Ill.

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Chucks, Collet

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Chucks, Drill and Tap

Hartford Special Mch. Co., Hartford, Conn.
Proconter Safety Chuck Co., 14 S. Clinton St., Chicago
Scully-Jones & Co., 1909 S. Rockwell St., Chicago, Ill.

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- Chucking Fingers**
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- Chucks, Quick Change**
Proconer Safety Chuck Co., 14 So. Clinton St., Chicago
- Chucks, Ring Wheel Grinder**
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- Cold Saws**
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Sutton Tool Co., Detroit, Mich.
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- Counterbores and Spot Facers**
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- Couplings, Flexible**
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W. H. Nicholson & Co., Wilkes-Barre, Pa.
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Mendes Cutting Factories, Inc., 505 Fifth Ave., New York City
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- Die Making Machines**
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- Die Sets**
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- Die Sinking and Engraving Machines**
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Standard Electrical Tool Co., Cincinnati, O.
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Star Mch. & Eng. Co., Bloomfield, N. J.
- Drill Jigs, Special**
Heuser Mfg., Co., 1638 No. Paulina St., Chicago, Ill.
- Drill Jigs, Universal**
Heuser Mfg. Co., 1638 No. Paulina St., Chicago, Ill.
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Buffalo Forge Company, Buffalo, N. Y.
Cleesman Mch. Tool Co., Green Bay, Wis.
- Drilling Machines, Gang**
Standard Electrical Tool Co., Cincinnati, O.

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Chicago, Ill.
Standard Electrical Tool Co., Cincinnati, O.
Strand Co., N. A., 5001 N. Lincoln St., Chicago
White Dental Mfg. Co., 10 E. 40th Street,
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Buffalo Forge Company, Buffalo, N. Y.
Burke Machine Tool Co., Connecticut, Oh.

Drilling Machines, Vertical

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Buffalo Forge Company, Buffalo, N. Y.

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Hardinge Brothers, Inc., Elmira, N. Y.

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Ohio Gear Co., Cleveland, Ohio
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Chicago, Ill.
Star Mch. & Eng. Co., Bloomfield, N. J.

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Grinders, Disc

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Dremel Manufacturing Co., Racine, Wis.
Skilesaw, Inc., 3304 Kinton Av., Chicago, Ill.
Standard Electrical Tool Co., Cincinnati, O.

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Valley Electric Corp., St. Louis, Mo.

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Mall Tool Co., 7742 S. Chicago Ave., Chicago
N. A. Strand & Co., 5001 N. Lincoln, Chgo.

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116 S. Aberdeen St., Chicago, Ill.
Dremel Manufacturing Co., Racine, Wis.
Skilaw, Inc., 3304 Elston Av., Chicago, Ill.
Standard Electrical Tool Co., Cincinnati, O.

Grinder, High Speed

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Dremel Manufacturing Co., Racine, Wis.
Mall Tool Co., 7742 S. Chicago Ave., Chicago

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Standard Electrical Tool Co., Cincinnati, O.
Valley Electric Corp., St. Louis, Mo.

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Grinding Attachments, Drill

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Oliver Instrument Co., Adrian, Mich.

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Walls Sales Corp., 96 Warren St., New York

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Oliver Instrument Co., Adrian, Mich.

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Standard Electrical Tool Co., Cincinnati, O.

Grinding Machines, Internal

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Lamp Guards

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Timesaver Products Co., 88 So. Desplaines
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Atlas Press Co., Kalamazoo, Mich.
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Sheldon Machine Co., 3255 Cottage Grove
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South Bend Lathe Works, South Bend, Ind.

Lathes, Back Geared

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South Bend Lathe Works, South Bend, Ind.

Lathes, Brake Drum

South Bend Lathe Works, South Bend, Ind.

Lathes, Engine

South Bend Lathe Works, South Bend, Ind.

Lathes, Gap Head

South Bend Lathe Works, South Bend, Ind.

Lathes, Manufacturing

Sundstrand Machine Tool Co., Rockford, Ill.

Lathes, Precision Bench

Hardinge Brothers, Inc., Elmira, N. Y.
Wade Tool Co., Waltham, Mass.

Lathes, Precision Bench Screw Cutting

Hardinge Brothers, Inc., Elmira, N. Y.

Lathe Service Parts

Mulholland Sales Co., Indianapolis, Ind.

Lathes, Screw Cutting

South Bend Lathe Works, South Bend, Ind.

Lathes, Speed

Schauer Machine Co., Cincinnati, Ohio

Lathes, Wood Turning

Delta Mfg. Co., Milwaukee, Wis.

Leader Pins, Steel

Acme Industrial Co., 419 N. Carpenter St.,
Chicago, Ill.

Leather Belting, All Types

Chicago Rawhide Mfg. Co., 1200 Elston Av.,
Chicago, Ill.

Leather Oil Retainers

Chicago Rawhide Mfg. Co., 1200 Elston Av.,
Chicago, Ill.

Leather Pkg., Hydraulic & Pneumatic

Chicago Rawhide Mfg. Co., 1200 Elston Av.,
Chicago, Ill.

Lubricator, Automatic

Noegren Co., C. A., Denver, Colo.

Machine Knives

Saw & Knife Specialty Co., Cleveland, Ohio

Machine Tender Stands

Angle Steel Stool Co., Plainwell, Mich.

Mandrels, Expanding

W. H. Nicholson & Co., Wilkes-Barre, Pa.
Western Tool & Mfg. Co., Springfield, O.

Micrometers

Bradley Machinery Co., Detroit, Mich.

Milling Attachments

Burke Machine Tool Co., Conneaut, Ohio
Wm. Carroll & Son, Norwood, Cincinnati, O.

Milling Machines, Bench

Burke Machine Tool Co., Conneaut, Ohio
Sundstrand Machine Tool Co., Rockford, Ill.

Milling Machines, Precision Bench

Hardinge Brothers, Inc., Elmira, N. Y.

Milling Machines, Hand

Burke Machine Tool Co., Conneaut, Ohio
Sundstrand Machine Tool Co., Rockford, Ill.

Milling Machines, Plain

Burke Machine Tool Co., Conneaut, Ohio
Sundstrand Machine Tool Co., Rockford, Ill.

Milling Machines, Universal

Geo. Gorton Machine Co., Racine, Wis.

Milling Machines, Vertical

Geo. Gorton Machine Co., Racine, Wis.

Mills, Adjustable Hollow

Genevieve Mfg. Co., Rochester, N. Y.

Motors

Chicago Electric Co., 1338 W. 22nd St.,
Chicago, Ill.

Motors, Small Universal

Dremel Manufacturing Co., Racine, Wis.

Motor-Generator Sets

Chicago Electric Co., 1338 W. 22nd St.,
Chicago, Ill.

Motor Drives, Universal

Culman Wheel Co., 1359 Altgeld St., Chgo.
Steege Mch. Co., 18 S. Clinton St., Chgo.

Motors, Electric Ball Bearing

Valley Electric Corp., St. Louis, Mo.

Moulds & Ladles, Hammer and Vise

Johnston Tool Co., East Providence, R. I.

Nibbling Machines

National Machine Tool Co., Racine, Wis.

Numbering Machines

Numberall Stamp & Tool Co., Staten Island,
N. Y.

Packing, Hydraulic

Chicago Rawhide Mfg. Co., 1200 Elston Av.,
Chicago, Ill.

Pigeon Hole Sections

Angle Steel Stool Co., Plainwell, Mich.

Pins and Lacing for Belting

Chicago Rawhide Mfg. Co., 1200 Elston Av.,
Chicago, Ill.

Pins, Leader And Dowel

Acme Industrial Co., 419 N. Carpenter St.,
Chicago, Ill.
Baumbach Mfg. Co., E. A., 1812 So. Kil-
bourne Ave., Chicago

Pipe Cutters

Ridge Tool Co., Elyria, Ohio

Pipe Vises

Ridge Tool Co., Elyria, Ohio

Classified Finding Index

Pipe Wrenches

Ridge Tool Co., Elyria, Ohio

Point Thinning Machines

Oliver Instrument Co., Adrian, Mich.

Press Brakes

Dreis & Krump Mfg. Co., 7440 Loomis Blvd., Chicago, Ill.

Presses, Arbor

Atlas Press Co., Kalamazoo, Mich.
W. H. Nicholson & Co., Wilkes-Barre, Pa.
Sheldon Machine Co., 3255 Cottage Grove Ave., Chicago, Ill.
Wilson, R. K., Buffalo, N. Y.

Presses, Power

Dreis & Krump Mfg. Co., 7440 Loomis Blvd., Chicago, Ill.

Presses, Punch

Dreis & Krump Mfg. Co., 7440 Loomis Blvd., Chicago, Ill.
Lewthwaite Mch. Co., T. H., 311 E. 47th, N. Y.

Production Tools

Genesee Mfg. Co., Rochester, N. Y.

Profiling Machines

Geo. Gorton Machine Co., Racine, Wis.

Pullers, Gear and Wheel

Armstrong-Bray & Co., 315 N. Sheldon St., Chicago, Ill.

Pumps, Lubricant

Ruthman Machinery Co., Cincinnati, Ohio

Punch Press Feeds

Littell Machine Co., F. J., 4125 Ravenswood Ave., Chicago, Ill.
Wittek Mfg. Co., 4809 W. 24th Place, Chgo.

Punch, Shear and Bender, Hand

Armstrong-Blum Mfg. Co., 341 N. Francisco Ave., Chicago

Punches, Hand

Armstrong-Blum Mfg. Co., 341 N. Francisco Ave., Chicago
Buffalo Forge Company, Buffalo, N. Y.
Lewthwaite Mch. Co., T. H., 311 E. 47th, New York
Whitney Metal Tool Co., Rockford, Ill.

Punches and Dies

Lewthwaite Mch. Co., T. H., 311 E. 47th, N. Y.

Pusher Tubes

Modern Collet & Machine Co., Ecorse, Mich.

Pyrometers

Illinois Testing Laboratories, Inc., 150 W. Austin Ave., Chicago
Pyrometer Instrument Co., 102-105 Lafayette St., New York City

Pyrometers, Optical

Pyrometer Instrument Co., 102-105 Lafayette St., New York City

Pyrometers, Portable & Stationary

Illinois Testing Laboratories, Inc., 150 W. Austin Ave., Chicago, Ill.

Pyrometers, Surface

Pyrometer Instrument Co., 102-105 Lafayette St., New York City

Racks

Yoh Supply Co., Canton, Ohio

Racks, Cut

Massachusetts Gear & Tool Co., Woburn, Mass.

Reamer Holders

W. H. Nicholson & Co., Wilkes-Barre, Pa.

Riveters, Multiple Spindle

Grant Mfg. & Mch. Co., Bridgeport, Conn.

Riveters, Pneumatic

Grant Mfg. & Mch. Co., Bridgeport, Conn.

Riveting Machines

Grant Mfg. & Mch. Co., Bridgeport, Conn.

Rod Cutters

Armstrong-Blum Mfg. Co., 341 N. Francisco Ave., Chicago
Lewthwaite Mch. Co., T. H., 311 E. 47th, N. Y.

Router Bits

Putnam Tool Co., Detroit, Mich.

Sanders

Sterling Products Co., Detroit, Mich.

Saws, Band and Circular for Metal

Saw & Knife Specialty Co., Cleveland, Ohio

Saw Sharpening Machines

Wardwell Manufacturing Co., Cleveland, O.

Screw Drivers, Electric

Haskins Co., R. G., 4654 W. Fulton, Chgo.

Screw Machine Parts

Modern Collet & Machine Co., Ecorse, Mich.

Set-Up Appliances

Standard Shop Equipment Co., Inc., Phila.

Shafts, Flexible

R. G. Haskins Co., 4654 W. Fulton, Chicago
Pratt & Whitney Co., Hartford, Conn.
Strand Co., N. A., 5001 N. Lincoln St., Chgo.
White Dental Mfg. Co., 10 E. 40th Street, New York, N. Y.

Shaping Machines

Osborne & Sexton Machy. Co., Colum

Shear Blades

Saw & Knife Specialty Co., Cleveland, Ohio

Shears, Hand

Armstrong-Blum Mfg. Co., 341 N. Francisco Ave., Chicago
Beverly Throatless Shear Co., 3007 W. 110th Place, Chicago, Ill.
Lewthwaite Machine Co., T. H., 311 E. 47th St., New York
Whitney Metal Tool Co., Rockford, Ill.

Shear, Power

Dreis & Krump Mfg. Co., 7440 Loomis Blvd., Chicago, Ill.

Shears, Slitting

Beverly Throatless Shear Co., 3007 W. 110th Place, Chicago, Ill.
Dreis & Krump Mfg. Co., 7440 Loomis Blvd., Chicago, Ill.
National Machine Tool Co., Racine, Wis.

Shears, Throatless

Beverly Throatless Shear Co., 3007 W. 110th Place, Chicago, Ill.

Speed Saws, Universal

Wyzenbeek & Staff, Inc., 642 Washington Blvd., Chicago

Classified Finding Index

Special Tools and Machinery

American Tool Works, Inc., Hartford, Conn.

Speed Reducers

Chicago Gear Works, 769 W. Jackson Blvd., Chicago
Cushman Wheel Co., 1359 Altgeld St., Chgo.
Ohio Gear Co., Cleveland, Ohio

Spools & Nuts for Auto. Screw Mchs.

Sutton Tool Co., Detroit, Mich.

Spot Welding Machines, Speed.

Wiser Engineering Co., Inc., Newark, N. J.
Pier Equip't. Mfg. Co., Benton Harbor, Mich.
Taylor-Winfield Corp., Warren, Ohio

Sprockets

Chicago Gear Works, 769 W. Jackson Blvd., Chicago
Cushman Wheel Co., 1359 Altgeld St., Chgo.
Massachusetts Gear & Tool Co., Woburn, Mass.
Ohio Gear Co., Cleveland, Ohio

Stampings

Garding Brothers, Cincinnati, Ohio

Stools and Chairs

Angle Steel Stool Co., Plainwell, Mich.

Straightening Machines

Whitney Metal Tool Co., Rockford, Ill.

Tables

Angle Steel Stool Co., Plainwell, Mich.

Tap Extractors

Walton Co., Hartford, Conn.

Tap Holders

Proconier Safety Chuck Co., 14 S. Clinton St., Chicago
Scully-Jones & Co., 1909 S. Rockwell St., Chicago, Ill.

Tapping Attachments

Proconier Safety Chuck Co., 14 S. Clinton St., Chicago, Ill.

Tapping Jigs, Universal

Heuser Mfg. Co., 1638 No. Paulina St., Chicago, Ill.

Tapping Machines and Attachments

Burke Machine Tool Co., Conneaut, Ohio
Claerman Mch. Tool Co., Green Bay, Wis.
Elico Tool Co., 594 Johnson Av., Brooklyn, N. Y.
Haskins Mch. Co., R. G., 4654 W. Fulton St., Chicago, Ill.
Proconier Safety Chuck Co., 14 S. Clinton St., Chicago, Ill.
Whitney Metal Tool Co., Rockford, Ill.

Thermometers, Resistance Type

Hinok Testing Laboratories, Inc., 150 West Austin Ave., Chicago, Ill.

Thread Dies

J. M. Colven, Yorkers, N. Y.

Threading Machines, Automatic, Stud

Grant Mfg. & Mch. Co. Bridgeport, Conn.

Threading Tools

Armstrong Bros. Tool Co., 808 N. Francisco Av., Chicago
Ridge Tool Co., Elyria, Ohio.
Rivett Lathe & Grinder Inc., Brighton, Boston

Tool Holders

Armstrong Bros. Tool Co., 808 N. Francisco Av., Chicago
Rigid Toolholder Co., Detroit, Mich.
Western Tool & Mfg. Co., Springfield, O.

Tool Post Turret

S. G. Colwell, Providence, R. I.

Tool Salvage

Henn Tool Co., Detroit, Mich.

Tools, Abrasive

White Dental Mfg. Co., 10 E. 40th Street, New York, N. Y.

Tools, Boring

Armstrong Bros. Tool Co., 808 N. Francisco Av., Chicago
Gairing Tool Co., Detroit, Mich.

Tool Grinding

Machinist's Tool Grinding Co., 3038 W. Van Huren St., Chicago

Tools, Lathe and Planer

Armstrong Bros. Tool Co., 808 N. Francisco Av., Chicago

Tools, Machinists'

Armstrong Bros. Tool Co., 808 N. Francisco Av., Chicago

Tools, Multi-Diameter

Gairing Tool Co., Detroit, Mich.

Tube Flanging Machines

Grant Mfg. & Mch. Co., Bridgeport, Conn.

Trucks

Angle Steel Stool Co., Plainwell, Mich.

Turret Lathes

Miltholland Sales Co., Indianapolis, Ind.

Turret Lathes Tools

Miltholland Sales Co., Indianapolis, Ind.

Universal Drill Jigs

Heuser Mfg. Co., 1638 No. Paulina St., Chicago, Ill.

Universal Joints

American Tool Works, Inc., Hartford, Conn.
Chicago Gear Works, 769 W. Jackson Blvd., Chicago

Used and Rebuilt Machinery

Aaron Mch. Co., 176 Lafayette St., N. Y. C.
Adams Mch. Co., 134 S. Clinton St., Chgo.
Alemo Engine Co., Hillsdale, Mich.
American Machinery Co., Cleveland, Ohio
Barad Tool & Sup. Co., 174 Lafayette, N. Y. C.
Beal & Co., Jos., Boston, Mass.
Belyea Co., Inc., 160 W. 18th St., New York, N. Y.
Bernstein & Co., Geo. M., 128 S. Clinton, Chgo.
Bieser Mfg. & Mch. Co., Springfield Ill.
Bradley Machinery Co., Detroit, Mich.
Brown Machinery Co., St. Louis, Mo.
Brownell Machinery Co., Providence, R. I.
Clinton Mch. Co., 33 S. Clinton St., Chgo.
Davis Machinery Co., Toledo, Ohio.
Centre Machinery Co., 249 Centre St., New York, N. Y.
Eastern Machinery Co., Cincinnati, O.
Emmerman, Louis E. & Co., 1781 Elston Ave., Chicago, Ill.
Easley Machinery Co., E. L., 825 Rees St., Chicago, Ill.
Ford Machinery Sales Co., Ford City, Pa.

Classified Finding Index

Used and Rebuilt Machinery—Cont.

George, James W., Detroit, Mich.
Goldman, Harvey H., Detroit, Mich.
Grand Machinery Exchange, 140 Centre St.,
New York, N. Y.
Herben Machinery Equipment Co., 30 S.
Clinton St., Chicago, Ill.
Hess-Schenck Co., Cleveland, Ohio
Hill, Clarke & Co., 645 W. Washington Blvd.,
Chicago, Ill.
Howarth Mch. Co., Inc., G. C., Detroit,
Mich.
Indianapolis Machinery & Supply Company,
Indianapolis, Ind.
International Machinery Co., Detroit, Mich.
Interstate Mch. Co., 130 S. Clinton, Chgo.
Iroquois Machinery Co., Buffalo, N. Y.
Johnson & Sons Machinery Co., Wm. C.,
St. Louis, Mo.
Johnstone Mch. Ex., Toledo, Ohio
Jones Machine Tool Co., Cincinnati, Ohio
Kennard-Rafain Mchry. Corp., 160 Liberty
St., New York, N. Y.
Lake Machinery Co., 654 W. Lake St.,
Chicago, Ill.
Loren, J. L., Bridgeport, Conn.
McDonald Machinery Co., St. Louis
Marr-Galbreath Mch. Co., Pittsburgh, Pa.
Midwest Equipment Co., 628 W. Lake St.,
Chicago, Ill.
Miles Machinery Co., Saginaw, W. S., Mich.
Molitor Machinery Co., Charles L., 120 S.
Clinton St., Chicago, Ill.
Morey & Co., 45 Mill St., Astoria, Long
Island, N. Y.
Morris Machinery Co., Newark, N. J.
Noble Mch. Co., Fort Wayne, Ind.
Norton-Broadway Machinery Co., Cincinnati,
Ohio
O'Brien Machinery Co., Philadelphia
Ohio Mch. & Supply Co., Cincinnati, Ohio
Ott Machinery Sales Co., Detroit, Mich.
Osborne & Sexton Mch. Co., Columbus, O.
Refiance Machinery Sales Co., Pittsburgh,
Pa.
Riverside Machinery Depot, Detroit, Mich.
Rozenkrans & Weisbecker, 2309 A Singer
Bldg., New York City
Russell Machine Co., Pittsburgh, Pa.
Scott-Hansbach Mch. Co., 4607 W. 20th St.,
Chicago
Scully Jones & Co., 1901 S. Rockwell St.,
Chicago, Ill.
Segal Machinery Co., 809 W. Lake St.,
Chicago, Ill.
Simmons Machine Tool Corp., Albany, N. Y.
Strong, Carlisle & Hammond Co., Cleveland
Sun Machinery Co., 28 Van Buren Street,
Newark, N. J.
Surplus Stock & Machinery Co., 1155 W.
Lake St., Chicago, Ill.
United Mchry. & Supply Co., St. Louis, Mo.
Victor Machinery Co., 128 S. Clinton Street,
Chicago, Ill.
Victor Machinery Exchange, 351 Center St.,
New York City
Vine, R. A., Detroit, Mich.
Wagener, P. P., Wilmette, Ill.
Wain Mch. Sales, Chas. E., Detroit, Mich.
Weber, H. J., Riverside, Ill.
West Penn Machinery Co., Pittsburgh, Pa.
White Mch. Co., A. D., 108 N. Jefferson
St., Chicago
Winterhoff Tool & Mch. Co., Elkhart, Ind.
Wiener Mch. Co., Inc., 237 Centre St.,
New York City
Wigglesworth Mch. Co., Cambridge, Mass.
Wolnick Machinery Sales, 21st & Marshal
Bldg., Chicago, Ill.

Vacuum Cleaners, Portable

Breuer Elec. Co., 846 Blackhawk St., Chgo.

Vacuum Cleaners, Industrial

Breuer Elect. Co., 846 Blackhawk St., Chgo.

Valves, Foot, Lever & Solenoid

Nicholson & Co., W. H., Wilkes-Barre, Pa.

Vices, Drilling Machine

Armstrong Blum Mfg. Co., 841 N. Francisco
Ave., Chicago
Armstrong Bros. Tool Co., 808 N. Francisco
Ave., Chicago
Graham Manufacturing Co., Providence, R. I.
Heuser Mfg. Co., 1638 No. Paulina St.,
Chicago, Ill.
L. W. Chuck Co., Toledo, Ohio
Martin Tool & Die Works, J. E., Springfield, O.
National Machine Tool Co., Racine, Wis.
Sampson Tool Co., Inc., 101 Walker St.,
New York, N. Y.
Sheldon Machine Co., 3255 Cottage Grove
Ave., Chicago, Ill.

Vices, Drill

Johnson Tool Co., East Providence, R. I.

Vices, Machinists'

Chicago Tool & Engr. Co., 8890 So. Chicago
Ave., Chicago, Ill.
L. W. Chuck Co., Toledo, Ohio
Sheldon Machine Co., 3255 Cottage Grove
Ave., Chicago, Ill.
Western Tool & Mfg. Co., Springfield, O.

Vices, Milling Machine

Graham Manufacturing Co., Providence, R. I.
Hartford Special Mch. Co., Hartford, Conn.
L. W. Chuck Co., Toledo, Ohio
Sheldon Machine Co., 3255 Cottage Grove
Ave., Chicago, Ill.

Vices, Shaper

Graham Manufacturing Co., Providence, R. I.
L. W. Chuck Co., Toledo, Ohio

Waste Cans

Angie Steel Stool Co., Plainwell, Mich.

Welded Steel Parts

Koch Sons, Geo., Evansville, Ind.

Welding Machines, Electric Spot

Esler Engineering Co., Inc., Newark, N. J.
Pier Equipment Co., Benton Harbor, Mich.

Welding Machines, Resistance

Esler Engineering Co., Inc., Newark, N. J.
Pier Equipmt. Mfg. Co., Benton Harbor, Mich.

Welding Service

Koch Sons, George, Evansville, Ind.

Wheel Dressing Diamonds

Menden Cutting Factories, Inc., 606 Fifth
Ave., New York City

Wheel Pullers

Armstrong-Bray & Co., 315 N. Sheldon St.,
Chicago, Ill.

Wheels, Grinding

Chicago Wheel & Mfg. Co., M. C. Tool Div.,
116 S. Aberdeen St., Chicago, Ill.

Woodworking Machinery

Tannowitz Works, Grand Rapids, Mich.

Worm Gear Motor Units

Star Mch. & Eng. Co., Bloomfield, N. J.

Wrenches, Ratchet

Lowell Wrench Co., Worcester, Mass.

Wrenches, Socket

Lowell Wrench Co., Worcester, Mass.

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Used and Rebuilt Machinery Section

Lists of Used and Rebuilt Machinery, either For Sale, Wanted, or For Exchange, set in uniform style, will be published in the Classified Section at the rate of 60 cents a line across the page, each issue, plus \$3.00 for name and address. Minimum charge, \$6.00. No display permitted.

Write directly to those offering the machines for sale, for prices and full descriptions. If what you seek is not advertised, use the blank enclosed to make known your wants in either new or used machinery and the publisher will pass them along to the advertisers.

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Centre Machinery Co., Inc.,	249 Centre St., New York, N. Y.
Lathe, 18x6 American Fox.....	\$200.
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Mill, 38" Baush vert., 2 hds.....	\$450.
Miller, W. & S. valve, 2 hds. ..	200.
Press, 4" str., Hibbard incl.	265.
Scr. mch., No. 4 W. & S., p. fd.	300.
Shaper, 25" Smith & Mills.....	450.

FOR SALE BY

Chas. E. Wain Machinery Sales,	7800 Mack Ave., Detroit, Mich.
Cut-off machine, Hurlbut, 3'.....	\$125.
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Drill, 20" Minster, 2" cap.....	650.
Drill, 24" Mechanics, b. g.....	125.
Drill, No. 13 P. & W. multiple.....	150.
Gates Tex Drive, 12 groove, 45'	\$ 45.
Lathe, 24x14.....	225.
Mill, Lincoln.....	75.
Rotary shear, 5' throat.....	40.

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J. Bleser Mfg. & Machy. Co.,	16th & Madison St., Springfield, Ill.
Air comp., 6x6 Ingersoll-Rand.....	\$ 130.
Knife grinder, 79".....	125.
Lathe, 36"x18 L. & S., m. d.....	1500.
Lathe, 18x8 Prentice q. c.....	325.
Lathe, 11x4, q. c., m. d., collets.....	150.
Miller, No. 3H LeBlond.....	\$ 500.
Miller, No. 2 Garvin univ.....	195.
Radial drill, 7' Bement.....	325.
Shaper, 16" Gould & Eberhardt.....	150.
Welder, 200 amp. arc.....	85.

FOR SALE BY

United Machinery & Supply Co.,	1241 Walton Ave., St. Louis, Mo.
Boring mill, 51" vert., Bullard, m. d.	Miller, Cincinnati hydromatic.
Brake, D. & K. 10"x10 ga., m. d.	Punch, horiz., 5/16" cap., H. & J.
Drill, Hartington 12', 6 spindles.	Rolls, Initial, 8"x4'.
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Miller, No. 3 Becker vertical, m. d.	Stoker, 150 h. p., new cheap.

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H. F. Wolnick Machinery Co.,	9 So. Clinton St., Chicago, Ill.
Drill, 20" Canedy-Otto, geared.	Miller, No. 3 B. & S. vert., s. p. d.
Drill, 4 sp., R-dington, No. 1 m. t.	Miller, No. 4B B. & S., pl., s. p. d.
Grinder, P. & W., 12" vertical.	Press, No. 6P Ferracute, 2" and 4" stroke, arr. for motor.
Grinder, t. & c. univ., Cinc. No. 1 1/2.	Saw grinder, C. & B. circular.
Miller, No. 4 Cinc. vert., s. p. d.	

FOR SALE BY

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LATHE.	
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FOR SALE BY

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Boring mills, Barrett 5" bar horiz.
Boring mill, Niles 36" vert., 2 hds.
Boring mill, Gisholt 42" vert. m. d.
Boring mills, Baush 44" vert., m. d.
Brake, Ohl 10" No. 10 ga. m. d. press.
Drills, Cin-Bickford 3" & 3 1/2" radials.
Gear cutter, G. & E. 36" s. p. d.
Gear cutter, G. & E. 60" m. d.
Gear hobber, G. & E. 24".
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Grinder, B. & S. Nos. 10 & 16 plain.
Grinder, B. & S. No. 13 univ. tool.
Grinder, Gardner 52" m. d., horiz. disc.
Lathes, Reed-Prentice 16"x8", q. c. g.,
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50 others in stock.
Milling machines, B. & S. No. 5, vert.
Milling mchs., B. & S. No. 1 1/2 Cinc.

No. 2, Hendey No. 1-B, Kemp.
No. 3; Ohio No. 29; vertical slott,
attach., all universal; Kemp, No. 1,
LeBlond No. 3-H; Brown & S.
No. 3-B, s. p. d., Brown & Sharpe
No. 3, all plain, Cincinnati 12"
Mfg.; Milw. No. 3-B s. p. d., d. o.
Cincinnati No. 3-S pl., s. p. d.
Punch press, Toledo No. 204 d. c.
Cons. Nos. 1 & 2 o. b. i. Niagara
No. 66 D d. c. Ohl d. c. grd.
Shapers, G. & E. S. & M., Cin., Ohio,
American, Steptoe, Queen City,
12", 16", 18", 20", 24" and 26"; S.
& M. 28", s. p. d.; Cin. 24" m. d. g. b.;
American 24" m. d., gear box.
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No. 2 automatic.
Turret lathes, W. & S. No. 2A univ.
Turret lathes, Gisholt universal.

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H. P.	TYPE	SPEED
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1-300	Cr. Wh.	200/400
1-250	El. Dy.	300/900
3-120	G. E.	300/750
1-100	West.	365/600
3-80	Diehl	500/1100
1-60	G. E.	400/1050
2-50	West.	225/600
1-40	West.	300/900
1-35	West.	500/1500
1-35	Cr. Wh.	800/1600
1-25	West.	400/1200
3-25	West.	650/2200
1-20	West.	650/1300
2-20	West.	375/1500
20-20	G. E.	650/1950
1-20	West.	500/1500
1-20	G. E.	500/1500
2-15	El. Dy.	300/900
1-15	West.	600/1200
6-15	West.	400/1600
1-10/14	El. Dy.	300/1200
30-10	West.	500/1500
20-10	G. E.	600/1800

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2-500 k. w. West. D. C. Gen., 250 v.
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coupled to 700 h. p. G. E. Type
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r. p. m.

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comp'd inter pole, dir. conn. to 290
h. p. G. E. Synch. Motor, 2300/440
v., 3 ph., 60 cy., 720 r. p. m.

A. C. MOTORS

Synch. Type

H. P.	TYPE	VOLTS	SPEED
1-2850	G. E.	2300/4150	450
1-675	Al. Ch.	2200/550	900
1-600	G. E.	2200/550	257
1-260	Al. Ch.	2200/440	720
1-125	West.	2300	900
1-50	G. E.	440/220	1200
1-35	G. E.	440/220	1200

SLIP RING

1-1200	West.	2200	360
1-600	G. E.	2300/550	257
1-600	G. E.	2300/440	705
1-450/360	West.	2200	875/700
1-400	West.	2300	514
1-400	West.	550	505
1-300	G. E.	550	575
1-250	F. Morse	2200	1200
1-250	West.	2300/440	700
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1-150	West.	220/440	580

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Air compressor, Daco No. 605P complete, motor and tank.....	\$ 85.
Air compressor, Curtis model A, 4½"x4½", 8 to 16 cu. ft.....	50.
Air compressor, Gardner, 6"x6", cap. 24½ to 40 cu. ft.....	100.
Air comp., Curtis, Model A, vertical, duplex, 8"x8", cap. 80-110 cu. ft.....	250.
Automatic screw machines, B. & S., Nos. 00, 0, 2.....	\$350. to 600.
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Automatic screw machine, B. & S. No. 19 high speed, cap. ½"x1½", m. d.....	400.
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Drill, Demco h. s., b. b., ½" capacity.....	135.
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Drill, 2 spindle Leland-Gifford h. s., b. b., 14", No. 2 M. T.....	250.
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Drill, 4 spindle, Avey, h. s., b. b., 14" swing, No. 2 M. T.....	400.
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32"x12' Boye & E., cone head q. c.
36"x16' Lodge & S., q. c., m. d.
42"x32'—American, grd. hd., m. d.

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No. 57 Toledo 18" bet. housing.
No. 5 L. & J. b. g., 5" stroke.

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20 k. w. National spot, 36".
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25 k. w. Thompson, 30".
35 k. w. Toledo, 36".

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Bolt cutter, 1 1/2" Acme.
Bolt cutter, 2" National.
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Hammer, 500 lb. Erie SF steam or air.
Hammer, Syntro Elec., 1/60/110/.
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Lathe, 16"x6" L. & S., g. h., ta., m. d.
Lathe, 11" Sundstrand, g. h., s. p. d.
Lathe, 24"x14" Hendey, q. c. g., tie-b.
Lathe, 12"x8" R. P., g. h., s. p. d.
Lathe, 12"x8" So. Bend. pl. ch gears.
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feed, m. d. (2).

Lathe, 18"x8" L. & S., q. c. g., t. a.
Lathe, 32"x14" Bridgeford g. h., m. d.
Lathe, 20"x8" Hendey, tie bar.
Lathe, 14"x19" Fay automatic.
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Miller, plain 1-y B. & S., rack feed.
Miller, 18" Cin. Mfg., motor 3/60.
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MISCELLANEOUS

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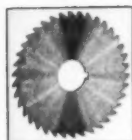
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3	3/64	1	3.30	1.32
3	1/16	1	3.40	1.36
3	3/32	1	3.40	1.36
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5	3/32	1	6.30	2.52
5	1/8	1-1/4	6.60	2.64
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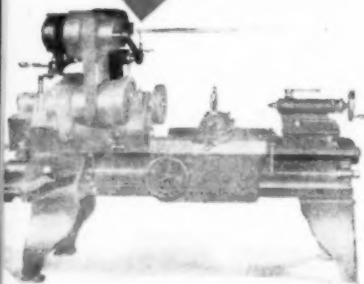
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